



***Operator's Guide
to System Monitoring***

Revision 21.0

DOC9299-3LA

Operator's Guide to System Monitoring

Third Edition

by

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This guide documents the software operation of the Prime Computer and its supporting systems and utilities as implemented at Master Disk Revision Level 21.0 (Rev. 21.0).

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About This Series

This series of Operator's Guides is designed and written to help you, as a system operator or a System Administrator of a Prime computer, do your job. These guides for system operators are logically divided into eight books to make them easy for you to use.

The next few pages describe Prime documentation that will be helpful to you as a system operator or as a System Administrator. To display an online list of Prime documentation, use the `HELP DOCUMENTS` command.

FOR THE SYSTEM OPERATOR

Before reading this book, you should have some familiarity with Prime systems. A good way to begin is to read the Prime User's Guide (DOC4130-41A) with its update documents (UPD4130-41A and UPD4130-42A), which explain the PRIMOS® file management system and provide introductory and tutorial information about essential commands and utilities.

Once you are familiar with Prime systems, read the Operator's System Overview, which outlines the material in the Operator's Guide series. Then, select the other books in the series as they apply to the tasks you must perform. As you learn more about system operations, use the Operator's Guide to System Commands as a reference for many of the special system commands and arguments that you, as an operator, need to perform your job. It fully documents most of the commands described in the books in this series.

The Operator's Guide Series

The following books contain detailed information for the system operator.

- Operator's System Overview (DOC9298-2LA) introduces the series and describes computer-room operation of Prime systems.
- Operator's Guide to System Monitoring (DOC9299-3LA) describes how to monitor system activity, messages, and use.
- Operator's Guide to File System Maintenance (DOC9300-3LA) describes the PRIMOS file system and explains how to format disk partitions, run the disk partition maintenance program, determine physical device numbers, and interpret disk error messages.
- Operator's Guide to the Batch Subsystem (DOC9302-3LA) describes how to set up, monitor, and control the Batch subsystem.
- Operator's Guide to the Spooler Subsystem (DOC9303-2LA) describes how to set up, monitor, and control the Spooler subsystem.
- Operator's Guide to System Commands (DOC9304-3LA) serves as a reference guide for most of the commands described in the other books in the series.
- Data Backup and Recovery Guide (DOC10129-1LA) describes how to save information on disk or tape and how to restore that information when it is needed.
- Operator's Guide to Prime Networks (DOC10114-1LA) describes how to set up Prime networking systems and provides reference information about running network-related programs and monitoring network events.

Other Books for the Operator

The following books are also of special interest to system operators.

- Operator's Master Index (DOC10110-3LA) indexes all the Operator and System Administrator Guides. Consulting this index is often the quickest way to find which manual has the information you need.
- The computer handbook for your particular CPU, which explains such topics as booting the system, shutting down PRIMOS, handling halts and hangs (including warm starts), performing tape dumps, and using the Virtual Control Panel (VCP).

- The "Using Your CPU" guide (available only for office machines) is intended for nontechnical users who are acting as system operators, and covers much the same information as the CPU handbooks.
- MAGNET User's Guide (DOC10156-11A), which describes the MAGNET utility, used to transfer data by magnetic tape from a non-Prime operating system to PRIMOS and vice versa.

FOR THE SYSTEM ADMINISTRATOR

In addition to the documentation in the Operator's Guide Series, be sure to read the System Administrator's Guide Series, which describes how to set up, configure, and maintain PRIMOS:

- System Administrator's Guide, Volume I: System Configuration (DOC10131-11A) explains how to build a system and allocate resources.
- System Administrator's Guide, Volume II: Communication Lines and Controllers (DOC10132-11A) explains how to configure communication lines.
- System Administrator's Guide, Volume III: System Access and Security (DOC10133-11A) explains PRIMOS security features and how to prevent unauthorized use of your system.
- DSM User's Guide (DOC10061-11A) explains how to use the Distributed System Management software, including how to configure and operate DSM.

These books also provide information for the operator about most of the commands necessary to operate your Prime system.

Other Recommended Reading

In addition to the books listed above, you may find the following books useful:

- New User's Guide to EDITOR and RUNOFF (FDR3104-101B) is a basic reference for any user of a Prime system and provides information about the Prime text editor and formatter.
- PRIMOS Commands Reference Guide (DOC3108-61A) provides detailed information about user commands.

- PRIMENET Planning and Configuration Guide, (DOC7532-3LA) describes how to plan, configure, and maintain PRIMENET™ software for a system.
- User's Guide to Prime Network Services (DOC10115-11A) explains Prime's networking systems.
- NTS User's Guide (DOC10117-11A) explains the Network Terminal Service.
- 50 Series Technical Summary (DOC6904-21A) describes the features of the 50 Series™ systems, including advanced architecture concepts and the software and hardware products the concepts support.

About This Book

The Operator's Guide to System Monitoring introduces new operators to both the concepts and the tools used for system monitoring. It also demonstrates how to perform some basic tasks, using PRIMOS commands.

You should have some familiarity with Prime systems before reading this book. If you are not familiar with the PRIMOS operating system, read the previous section, ABOUT THIS SERIES.

HOW THIS BOOK IS STRUCTURED

This book has four chapters and one appendix:

- Chapter 1 reviews supervisor terminal messages and your response to these messages. It includes a description of the RESUS command, which enables you to use a user terminal for supervisor terminal functions.
- Chapter 2 covers the four PRIMOS commands that you use to monitor the hardware and system events.
- Chapter 3 describes the Prime Distributed System Management (DSM) and the DSM commands you use to manage and display system event log files.
- Chapter 4 describes the System Information and Metering (SIM) commands, which allow you to obtain information about the state and performance of a network of computer systems.
- Appendix A explains the PRINT_SYSLOG command, which is replaced at Rev. 21.0 by the DISPLAY_LOG command. You can continue to use PRINT_SYSLOG to read pre-Rev. 21.0 system log files.

PRIME DOCUMENTATION CONVENTIONS

The following conventions are used in command formats, statement formats, and in examples throughout this document. Examples illustrate the uses of these commands and statements in typical applications.

<u>Convention</u>	<u>Explanation</u>	<u>Example</u>
UPPERCASE	In command formats, words in uppercase indicate the names of commands, options, statements, and keywords. Enter them in either uppercase or lowercase.	SLIST
lowercase	In command formats, words in lowercase indicate variables for which you must substitute a suitable value.	LOGIN user-id
Abbreviations in format statements	If an uppercase word in a command format has an abbreviation, either the abbreviation is underscored or the name and abbreviation are placed within braces.	LOGOUT { SET_QUOTA } SQ
Brackets []	Brackets enclose a list of one or more optional items. Choose none, one, or more of these items.	LD [-BRIEF -SIZE]
Braces { }	Braces enclose a list of items. Choose one and only one of these items.	CLOSE { filename ALL }
Braces within brackets [{ }]	Braces within brackets enclose a list of items. Choose either none or only one of these items; do not choose more than one.	BIND [{ pathname options }]
Ellipsis ...	An ellipsis indicates that the preceding item may be entered more than once on the command line.	SHUTDOWN pdev-1 [...pdev-n]
Parentheses ()	In command or statement formats, you must enter parentheses exactly as shown.	DIM array (row, col)

<u>Convention</u>	<u>Explanation</u>	<u>Example</u>
Hyphen -	Wherever a hyphen appears as the first character of an option, it is a required part of that option.	SPOOL -LIST
<u>Underscore</u> in examples	In examples, user input is underscored but system prompts and output are not.	OK, <u>RESUME MY_PROG</u> This is the output of MY_PROG.CPL OK,
Apostrophe ,	An apostrophe preceding a number indicates that the number is in octal.	'200
Angle brackets in examples < >	In examples, the name of a key enclosed within angle brackets indicates that you press that key.	OK, <u>ED</u> <RETURN>
Angle brackets in messages < >	In messages, a word or words enclosed within angle brackets indicates a variable for which the program substitutes the appropriate value.	Disk <diskname>

1

Supervisor Terminal Messages

This chapter introduces the use of the supervisor terminal to monitor the system. You can issue many of the commands described later in this book from any user terminal. However, in general, more complete information is displayed when the commands are issued from the supervisor terminal.

The following functions of the supervisor terminal are discussed in this chapter:

- Using the video display unit as a supervisor terminal
- Using a user terminal as a supervisor terminal (RESUS)
- Supervisor terminal messages
- Message examples

USING A VIDEO DISPLAY UNIT AS A SUPERVISOR TERMINAL

On some systems, the supervisor terminal is a Video Display Unit (VDU) rather than a hard-copy terminal. Because VDU terminals do not produce a printed copy of operator commands and system messages, create and maintain a command output (COMOUTPUT) file as a record.

OPERATOR'S GUIDE TO SYSTEM MONITORING

Start the command output file during system startup. For example, type the following command line to start a command output file called SYSTEM.COMO:

```
OK, COMOUTPUT CMDNCO>SYSTEM.COMO
```

It is also a good idea to start off your command output file with the DATE command so that you have a record of when a particular log of supervisor terminal messages was created.

You or your System Administrator can insert the appropriate COMOUTPUT command into the system startup file PRIMOS.COMI (or C_PRMO). This creates a command output file each time you start up the system.

Caution

Do not SLIST or otherwise display the open command output file at the supervisor terminal. If you do, output from SLIST also goes into the command output file, producing a never-ending display that fills up the disk.

To limit the size of the command output file, spool the file frequently and then delete it. Do this at least once a day, or at more frequent intervals if your system runs twenty-four hours a day. Before spooling the command output file, remember to close it with the COMOUTPUT -END command. Using the previous CMDNCO>SYSTEM.COMO file as an example, at the end of the day (or whenever you decide to start up another command output file), enter the following commands:

```
COMOUTPUT -END  
SPOOL CMDNCO>SYSTEM.COMO  
DELETE CMDNCO>SYSTEM.COMO
```

Bear in mind that if you close an output file and then open a new one, some information may not be written to either COMO file. To avoid losing any data, it is a good practice to open a new COMO file, giving it a different name each time. This action automatically closes the previous COMO file, which you can spool and delete at any time.

One way to give each COMO file a unique name is to append the date and time to the filename. For example,

```
COMOUTPUT CMDNCO>SYSTEM.COMO.08.12.16.00
```

This indicates a COMO file for August 12 beginning at 4:00 p.m.

For ease in reading and writing the file, give the file a read-write lock of UPDT (which allows multiple readers plus one writer). Do this by entering the RWLOCK command (described in the PRIMOS Commands Reference Guide) after issuing the COMOUTPUT command, as in the following example:

```
OK, COMOUTPUT CMDNCO>SYSTEM.COMO
OK, RWLOCK CMDNCO>SYSTEM.COMO UPDT
```

Limit access to the command output file as follows:

- On ACL-protected systems, allow user SYSTEM at least DALURW access to the directory containing the command output file.
- On password-protected systems, either use the PROTECT command to set the command output file to RWD RWD, or do not give a password to the directory in which it resides. The following example illustrates the PROTECT command:

```
OK, PROTECT CMDNCO>SYSTEM.COMO RWD RWD
```

USING A USER TERMINAL AS A SUPERVISOR TERMINAL

When you operate the Distributed System Management (DSM) service, the RESUS command allows the System Administrator to enable a user terminal for use as the supervisor terminal. System operators can then coordinate routine operations on a network of systems from any terminal on any site. However, only one terminal at a time may function as a supervisor terminal.

Use of the RESUS command is restricted to authorized users as specified in the DSM configuration file. Refer to the DSM User's Guide for detailed information on allowing privileged users access to RESUS.

Note

Use of the term supervisor terminal in this manual refers to both the physical supervisor terminal and a logical supervisor terminal that has been enabled by the RESUS command.

The format of the RESUS command is

```
RESUS { -ENABLE
        -DISABLE [ -FORCE ]
        -START   [ -ON nodename ]
        -STOP
        -STATUS   [ -ON { nodename
                        nodegroup } ]
        -HELP
        -USAGE }
```

The RESUS command has the following options:

<u>Option</u>	<u>Description</u>
-ENABLE	Enables RESUS at the local node. Once RESUS is enabled, any authorized local or remote user can gain supervisor terminal privileges on the system, by issuing RESUS -START from a user terminal. In effect, your user terminal becomes the logical supervisor terminal. Once RESUS is enabled, the real or physical supervisor terminal no longer functions as the supervisor terminal; it echoes only the commands that you enter and the system's responses. It ignores all input except the RESUS -DISABLE and RESUS -DISABLE -FORCE commands. When RESUS is enabled, the system and error prompts change, respectively, to

<nodename>.RESUS_OK>

<nodename>.RESUS_ER>

-DISABLE	Disables RESUS at the local system. This option applies only to the physical supervisor terminal. Disabling RESUS on one system has no effect on authorized users of that system gaining control of other systems where RESUS is enabled.
----------	---

Note

You can issue the -ENABLE and -DISABLE options at the physical supervisor terminal.

<u>Option</u>	<u>Description</u>
-DISABLE -FORCE	Forcibly disables RESUS at the local system, even if another user is controlling the system through RESUS. The user's terminal is disabled from functioning as a supervisor terminal and normal supervisor terminal activity is returned to the physical supervisor terminal. This option is valid only at the physical supervisor terminal.

Notes

When you forcibly disable RESUS, the User 1 process remains in the most recently entered subsystem. To return the supervisor terminal to monitor level, simply quit the subsystem in the normal way. To identify the subsystem, refer to the supervisor terminal record.

There may be a short delay between entering the RESUS -DISABLE -FORCE command at the supervisor terminal, and its execution. The RESUS command accepts type-ahead.

-START [-ON nodename]

Assumes control of a system where RESUS is enabled from a user terminal. If you do not specify a nodename, the local system is assumed. Not available from the physical supervisor terminal, or from a terminal already using RESUS.

You cannot control more than one system at a time through RESUS, and only one user can be in control of a system at any time.

-STOP

Terminates the RESUS session and returns the terminal to the PRIMOS command level at the system where you are logged in. A message similar to the following is displayed when the RESUS session ends:

16 Oct 86 14:37:22 Thursday :
RESUS facilities no longer in use
OK,

<u>Option</u>	<u>Description</u>
-STATUS $\left[\begin{array}{l} \text{-ON} \left\{ \begin{array}{l} \text{node} \\ \text{nodegroup} \end{array} \right\} \end{array} \right]$	Displays the enable/disable status and current users of RESUS on a system or node group. If you do not specify a <u>nodegroup</u> , the local system is assumed.
<u>-HELP</u> $\left[\left\{ \begin{array}{l} \text{-NO_WAIT} \\ \text{-NW} \end{array} \right\} \right]$	Gives you information on how to use the command. Overrides other options. If you specify the -NO_WAIT option, the display is not paginated at your terminal.
-USAGE	Gives you the command format.

Special Precautions With Some PRIMOS Commands

RESUS creates a special environment. This systems control facility operates through the networking software. Use caution when issuing the following commands from within a RESUS session.

<u>Command</u>	<u>Description</u>
STOP_DSM	Do not issue the STOP_DSM command while you are using RESUS. The operation of RESUS itself depends on DSM running on the system.
NETLINK	Do not attempt to invoke NETLINK while controlling a system through RESUS. If you do, your netlink session switches to the supervisor terminal and is lost at your terminal. If you enter NETLINK by accident while using RESUS, disable RESUS at the physical supervisor terminal and quit the NETLINK session from there.
TERM	This command allows remote or local system users to customize their operating environment. Such changes remain in force on the logical supervisor terminal when the terminal returns to local control. Because others will use the terminal after you, do not to alter the environment at all, either when operating the system from the physical supervisor terminal, or from a user terminal through RESUS.

<u>Command</u>	<u>Description</u>
AMLC	When you use RESUS to control the local system from a local terminal, it is possible to deassign the line to the terminal. In this event, you can recover control only by disabling RESUS at the physical supervisor terminal, and reconfiguring the line.
LOGOUT	If the DSM server is inadvertently logged out while RESUS is being used on a system, the supervisor terminal function can be temporarily lost. Restore normal function by disabling RESUS at the physical supervisor terminal.
ICE	This emergency reinitialization command resets your command environment to the login state and resets all terminal prompts to PRIMOS defaults. If used within RESUS, you may lose the RESUS prompts for the remainder of the session.
USRASR	USRASR allows the supervisor terminal to act as a user terminal. Do not issue this command while in RESUS. It can hang the User 1 process, which requires special recovery procedures.

Caution

Take care when using subsystems, such as EMACS, which take advantage of special terminal characteristics, from a user terminal functioning as a supervisor terminal under RESUS. The user terminal must be identical to the supervisor terminal (for example, both must be PT200™ terminals). Otherwise, because the session echoes at the physical supervisor terminal, the terminal may lock. Return the logical supervisor terminal to User Terminal mode before using EMACS or any subsystem with these characteristics, unless you are certain the two terminals are of the same type.

SUPERVISOR TERMINAL MESSAGES

PRIMOS and other processes running on the system can cause messages to be sent to the supervisor terminal. As the system operator, you are responsible for observing these messages and taking appropriate action. These messages can be categorized as follows:

- Login/logout messages
 - Usually informative, but may sometimes require action
 - Include failed login attempt and phantom abort messages
 - Refer to the following section
- User request messages
 - Require action
 - See the Operator's Guide to System Commands
- Subsystem messages
 - Usually informative
 - Include Batch, Spool, C2 Security, and FTS messages
 - Relevant books are
 - Operator's Guide to the Batch Subsystem
 - Operator's Guide to the Spooler Subsystem
 - System Administrator's Guide, Volume III: System Access and Security
 - Operator's Guide to Prime Networks
- VCP/diagnostic processor messages
 - Informational and error related, but may require action
 - Occur during system startup and halts
 - See the handbook for your CPU
- Disk error messages
 - May require action
 - Occur during normal system running
 - See the Operator's Guide to File System Maintenance

- Network messages
 - May require action
 - Occur when you begin or terminate activity on the network, when you start up or stop Network Terminal Service, or when you issue the MONITOR_NET command
 - See the Operator's Guide to Prime Networks and the NTS User's Guide
- C2 Security Messages
 - May require action
 - Refer to the System Administrator's Guide, Volume III: System Access and Security.

If you are unsure about the meaning of a message, contact your System Administrator for assistance. Refer to the end of this chapter for examples of each type of message.

Terminal Messages Related to Logins and Logouts

You can receive three kinds of login/logout messages, depending on which configuration directives your System Administrator has included in the system configuration file:

- Login/logout events
- Uncorrectable memory parity errors
- Failed login attempts

Login/Logout Event Messages: If the configuration directive LOGMSG YES is in the system configuration file, all logins and logouts are reported to you at the supervisor terminal. Most of these login/logout messages are normal and require no action on your part. The following two examples show login and logout messages for user SMITH.

SMITH (user 4) logged in Friday, 24 Oct 86 14:30:12.

SMITH (user 4) logged out Friday, 24 Oct 86 17:00:56.
Time used: 02h 30m connect, 20m 14s CPU, 02m 09s I/O.

Uncorrectable Memory Parity Errors (ECCU): If the configuration directive MEMHLT NO is in the system configuration file, you also receive notification of forced logouts (of terminal users, phantoms, and servers) because of an ECCU memory parity error. The following

message shows the system server NETMAN logged out because of an ECCU error:

User 11 (NETMAN) logged out due to a memory parity error.

ECCU errors rarely occur. If they do and if MEMHLT NO is specified, PRIMOS forcibly logs out the system phantom that incurred them, such as the Batch monitor, NETMAN, the Route-through Server, the FTS Servers, the FTS manager, or a spooler phantom. If one of these system phantoms is logged out because of an ECCU error, try to restart the phantom, using one of the following commands:

<u>System Phantom</u>	<u>Command</u>
BATCH_SERVICE	BATCH -START [options]
FTS-server name	FTOP -START_SRVR server-name
YTSMAN	FTOP -START_MNGR
spooler name	PROP spooler-name -START
NETMAN	START_NET -NODE nodename [config_pathname]
RT_SERVER	PHANTOM PRIMENET*>RT.COMI
LOGIN_SERVER	START_LSR
DSMNETSR	START_DSM
DSMSR	START_DSM
DSMASR	START_DSM
SYSTEM_MANAGER	START_DSM

If the system phantom continues to fail, contact your System Administrator.

An ECCU error may also cause a user phantom to be forcibly logged out. In this case, a message is sent to the supervisor terminal informing you of the logout, but the system does not send a message to the user's terminal. Note that the user phantom logged out and send a message to inform the user that the phantom has failed.

Failed Login Attempts: If the configuration directive LOGBAD YES is in the system configuration file, information on all unsuccessful login attempts appears at your supervisor terminal. For example,

Failed login Friday, 24 Oct 86 14:40:32: Line #2, UserId TREAT.

If the terminal line number or the PRIMENET node name is known, the message also displays this information.

The following example shows a failed remote login:

```
Failed remote login Monday, 24 Nov 86 10:17:20: UserId PARISH
from PRIMENET system SYSF.
```

A large number of these messages originating from the same user or the same line may indicate an attempt on the system's security. Inform your System Administrator.

MESSAGE EXAMPLES

Most of the messages appearing at the supervisor terminal inform you of changes in the status of the system. In general, these messages do not indicate anything that requires your immediate attention.

When DSM is running, the messages can be in one of two formats: brief or full. Brief format messages give you a signal that an event has occurred. As such, they do not interfere with any other work you may be doing from the supervisor terminal. For a detailed summary of the message, refer to the log file. The following example shows a disk read error message in brief format:

```
***DSMASR (user 177) on ENPUB2) at 16:07
16:07 LOG_DISK (ENPUB2) Information
```

Full format messages, on the other hand, give additional information concerning the event or error. Each line of the message is preceded by the message header.

The same disk error reported by the above message sends the following information in a full format message:

```
*** DSMASR (user 177 on ENPUB2) at 16:07
16:07 LOG_DISK (ENPUB2) Information

*** DSMASR (user 177 on ENPUB2) at 16:07
DISK READ ERROR, DEVICE NUMBER = 003060 (OCT)(4005 CTRLR 1 UNIT 0)CRA=000000

*** DSMASR (user 177 on ENPUB2) at 16:07
002103 (OCT)

*** DSMASR (user 177 on ENPUB2) at 16:07
CYLINDER = 10 HEAD = 1 RECORD = 2 (9 SECTORS PER TRACK)STATUS (ACCUM) = 110000

*** DSMASR (user 177 on ENPUB2) at 16:07
(OCT) STATUS (LAST) = 110000 (OCT) RETRIES = 10

*** DSMASR (user 177 on ENPUB2) at 16:07
WORD NUMBER - 001301 (OCT) CORRECTION = 000040 000000 (OCT) (CORRECTED)
```

At Rev. 21.0, the format of supervisor terminal messages depends on the options selected when you or your System Administrator configure the Unsolicited Message Handler (UMH). Refer to the DSM User's Guide for the format and options to the CONFIG_UM command that tailor your supervisor terminal messages to your needs.

The examples shown below are typical messages that appear at the supervisor terminal.

Login/Logout Messages

All of the following login/logout messages are informational.

- MILLEN (user 7) logged in Monday, 24 Nov 86 14:30:12.

A user has logged in.

- JACKSON (user 18) logged out Friday, 21 Nov 86 17:00:56.
Time used: 02h 30m connect, 00m 09s CPU, 00m 11s I/O.

A user has logged out. Time used is printed. The kinds of time used are connect time, CPU time, and disk I/O time, respectively.

- User 43: Phantom requested terminal input.

A phantom has requested terminal input and has been logged out.

- PHANTOM 105: LSTATS Not found.

A phantom not using a command output file has encountered an error and has been logged out.

User Request Messages

All user request messages require a response from you.

- ***** Magtape request *****

From WALTON (user 32): MTX -ALIAS MTO

User WALTON is requesting that you assign him the next available tape drive. Use the REPLY command, described in the Operator's Guide to System Commands.

- *** BUCHNER (user 4) at 15:58
Can you increase the quota on my directory BUCH - I'm out of space

User BUCHNER wants you to use the SET_QUOTA command to increase the quota on her directory.

Subsystem Messages

The following Batch messages are informational only. The Batch messages that appear at the supervisor terminal are explained in the Operator's Guide to the Batch Subsystem. Batch messages are easily identified because they all either begin with *BATCH* or are sent by user BATCH_SERVICE.

- *** BIRD (user 33 on SYSM) at 08:44
BATCH Executing basketball for BIRD(#10027).

A BATCH job has begun executing.

- *** BATCH_SERVICE (user 43 on SYSR) at 13:02
Job runprog for DAVIS(#10014) completed.

A BATCH job has completed.

- *** BATCH_SERVICE (user 12 on P20) at 01:21
Monitor in operation.

The BATCH monitor has been started.

- *** BATCH_SERVICE (user 20 on SYSF) at 18:56
Operator stop.

The BATCH monitor has been stopped.

C2 Security Messages

The following messages are typical C2 Security messages. Refer to the System Administrator's Guide, Volume III: System Access and Security for details. C2 Security messages display at the supervisor terminal whether or not DSM is running.

- [SECURITY_MONITOR Rev 1.0 Copyright (c) Prime Computer, Inc. 1986]

07:02:06 : Switching log file to: SECURITY_LOG.860826.070206

07:02:06 : The number of buffers is: 4

07:02:06 : The following users have been enabled: ALL

07:02:06 : The following have been enabled:

Events: ALL

Event types: ALL

OK,

Message from AUDITOR (User 2): The security monitor is running.

The SECURITY_MONITOR -START command was given, starting up the security monitor.

- [SECURITY_MONITOR Rev. 1.0 Copyright (c) Prime Computer, Inc. 1986]

Do you really wish to stop the SECURITY_MONITOR (yes/no)? : YES

OK,

Message from Auditor (user 2): The security monitor has been shut down.

The SECURITY_MONITOR -STOP command was given, thus stopping the security monitor.

- Auditing must be stopped before shutting down.

An attempt was made to use the SHUTDOWN command without first shutting down the security monitor.

VCP/Diagnostic Processor Messages

The following two messages are examples of messages that you receive while you are in Virtual Control Panel mode. For detailed information on these types of messages, see the handbook for your CPU.

- DPM004: Central Processor System verified.

A diagnostic processor message displayed during a cold start.

- DPM007: System Booting, please wait.

A diagnostic processor message displayed during a cold start.

Disk Error Messages

Two examples of disk error messages are shown below. See the Operator's Guide to File System Maintenance for a full explanation of disk errors.

- ***DSMASR (user 171 on ENPUB2) at 17:01
17:01 LOG_DISK (ENPUB2) Information
- ***DSMASR (user 171 on ENPUB2) at 17:01
DISK ERROR IN IOOP MODE: OPCODE = 140014 (OCT) DEVICE NUMBER = 000462 (OCT)
- ***DSMASR (user 171 on ENPUB2) at 17:01
(10019 CTRLR 1 UNIT 1)
- ***DSMASR (user 171 on ENPUB2) at 17:01
CRA = 000000 000002 (OCT)
- ***DSMASR (user 171 on ENPUB2) at 17:01
CYLINDER = 0 HEAD = 0 RECORD = 2 (9 SECTORS PER TRACK)
- ***DSMASR (user 171 on ENPUB2) at 17:01
LSW = 101400 100000 (OCT) PSW = 000000 020100 (OCT) DEVICE NUMBER = 000462 (OCT)
- ***DSMASR (user 171 on ENPUB2) at 17:01
(INTERRUPT TYPE = 000005 (OCT) REQUEST_ID = 144536 (OCT))

A corrected disk error involving an intelligent controller occurred. This can be the result of a hardware failure, a controller failure, or disk bad spots. Although not a serious error, frequent messages may portend serious problems with the indicated disk drive or disk pack.

- ***DSMASR (user 171 on ENPUB2) AT 14:43
- DISK MIRROR BROKEN. PRIMARY <pppppp> (OCT) SECONDARY <ssssss> (OCT)

This error indicates an uncorrectable read error. When this occurs from both disks in the mirror, the mirror is broken. The Copy Server gets an uncorrectable error and logs out, thus breaking the mirror.

Note

The above are examples of disk error messages that display when DSM is running. If DSM is not running, the disk error messages display without the DSMASR header.

IOOP Mode Initialization Messages

The following messages may display if problems occur when downline loading to an intelligent controller.

- Disk download file <file name> not found (disk_init).

Unable to locate downline load file filename. Specify correct downline load filename.

- Failure to enter ICOP mode <controller address> (OCT) (disk_init).

The system downloaded to the Intelligent Controller. However, the controller failed to enter Intelligent mode. This indicates a hardware problem, for example a download to controller revision mismatch, or a controller memory problem.

- I/O Errors while processing a disk DLL file <file name> (disk_init).

The system was unable to read the downline load file filename.

The following message appears when a successful downline load and initialization of an intelligent controller is completed.

- DLL and init ICOP complete <controller address> (OCT) (disk_init).

2

Monitoring the System

Chapter 1 discussed the messages that PRIMOS or other processes send to the supervisor terminal. These messages display automatically, as they are specified in the configuration file.

In addition to these automatic messages, you can invoke commands that display specific information about activity on the system. These commands allow you to closely monitor the system for information, such as the status of the CPU and various other parts of the system hardware, the status of the network, and which user is logged in on what line.

If you have a series of logbook entries from regular system monitoring, you may be able to foresee trouble and forestall it. If the system does develop a problem, you can backtrack through the logs and command output files of monitoring sessions to find a use or event pattern that may disclose a cause. Monitoring output files, such as command output files, is particularly useful for finding the cause of intermittent, unpredictable problems.

This chapter describes the four PRIMOS commands that allow you to monitor the system: STATUS, LIST_QUOTA, AVAIL, and USAGE. The functions of these commands are as follows:

<u>Command</u>	<u>Function</u>
STATUS	Monitors high-level system data. Such data includes information about users, the status of

<u>Command</u>	<u>Function</u>
	devices and the network, the current version of PRIMOS, and the amount of physical memory.
LIST_QUOTA	Displays the number of records used at various levels in a directory tree.
AVAIL	Reports on total disk space and available disk space.
USAGE	Monitors events internal to the system at the hardware level. These events include the total CPU time used since the system was started up, the number of input/output operations occurring per second during the sampling time, and per-user memory, CPU, and I/O use statistics.

If you have a video display unit as the supervisor terminal, these commands display their information on the screen, not as hard copy. To obtain a hard copy of the display, use the COMOUTPUT command to start a command output file before you begin the monitoring sequences. After you close the file with the COMOUTPUT -END command, print the file with the SPOOL command.

You can use the following commands to monitor network activity:

<u>Command</u>	<u>Function</u>
MONITOR_NET	Monitors PRIMENET and LAN300 activity
FTOP	Monitors File Transfer Service activity
LIST_LHC_STATUS	Monitors LAN300 Host Controller activity
LIST_LTS_STATUS	Monitors LAN300 Terminal Server activity

These commands are detailed in the Operator's Guide to Prime Networks.

THE STATUS COMMAND

The STATUS command monitors higher-level system events. When invoked with the ALL option at the supervisor terminal, the STATUS command displays the following information, in the order listed:

1. The version of PRIMOS your system is running, followed by a copyright notice.
2. The size, in kilobytes, of main memory.

3. Your user ID (SYSTEM), the network node name of your system, and the file units that you have open.
4. All currently assigned magnetic tape drives, including their physical and logical device numbers, and the user ID and user number of the assignees.
5. Information on communications controllers, including names, types, device addresses, and number of lines.
6. All currently started partitions, including their names, logical device numbers, physical device numbers (for local partitions only), and node names (for remote partitions only).
7. System and user semaphores.
8. All configured network nodes and their status (up or down).
9. All Network Terminal Service (NTS) information.
10. The physical device numbers of the command partition and paging partitions.
11. All logged-in users, including their user IDs, user numbers, terminal line numbers (in octal and decimal), in-use partitions, and assigned devices.

An example of the STATUS ALL display, with explanations of each field, appears later in this chapter.

The STATUS command allows you to answer such questions as

- Is anyone using the system? (This is useful when the system is about to be shut down.)
- Is anyone using a partition that is about to be backed up or shut down?
- Which partitions are currently started?
- Which tape drives are in use and by whom?
- Which user is using which terminal?
- Which remote users, phantoms, and slave processes are using the system?
- How are the system's communication controllers configured?

This information allows you to monitor the state of the system before you start any system operation. You can then make sure that users who may be affected by a system operation are warned before the process is started. You may then want to tell them to log out. Use STATUS before every operation that alters user/system interactions. Such operations

include shutting down the system for preventive maintenance, formatting a partition (using MAKE), and performing a backup.

Format and Options of the STATUS Command

The STATUS command format is as follows:

STATUS [option]

You can specify only one option. The options and their descriptions are as follows:

<u>Option</u>	<u>Description</u>
<u>ALL</u>	Displays the version of PRIMOS currently running, main memory size, open file units, assigned magnetic tape devices, communications controller information, started partitions, semaphore information, network nodenames and their status, the physical device numbers of the paging and command partitions, mirroring information for paging partitions, and information on all logged-in users.
<u>COMM</u>	Displays information on communications controllers (excluding the Prime Node Controller) present in a system. For each controller, the information includes the controller name, its type, its device address, the number of asynchronous lines on it, the number of synchronous lines on it, and the number of bad lines.
<u>DEVICES</u>	Displays physical device numbers, user IDs, user numbers, and logical device numbers of all currently assigned magnetic tape devices.
<u>DISKS</u>	Lists all currently started partitions, including partition names, logical device numbers, physical device numbers of local partitions, and node names of remote partitions. Also displays information on mirrored partitions.
<u>ME</u>	When used from the supervisor terminal, displays information on all users (identical to STATUS USERS). Line numbers are displayed in both octal and decimal. When used from a user terminal, displays information on the user who gave the command.

<u>Option</u>	<u>Description</u>
<u>NETWORK</u>	Displays the names and status of the full-duplex, ring, LAN300, Route-through, and packet-switched data networks.
<u>NTS</u>	Displays the status of the LAN300 Network Terminal Service.
<u>PROJECTS</u>	Lists the project names and user numbers of all currently logged-in users.
<u>SEMAPHORE</u>	Displays all semaphores, their values, and, for semaphore numbers larger than 64, their users.
<u>SYSTEM</u>	Displays the version of PRIMOS in operation, the name of the system, and, if the command is given from the supervisor terminal, the amount of physical memory in use.
<u>UNITS</u>	Displays the user ID, system name, and information for each file unit currently open for the user.
<u>USERS</u>	Displays user numbers, line numbers, and all partitions and assigned devices in use by each user currently logged in to the system. Also displays the priority level of each user if the user's priority level is other than the default level (see the CHAP command).

Example of the STATUS Command

When given from the supervisor terminal, the STATUS ALL command displays all the system information shown in the following example. A detailed description of the information follows the display.

OK, STATUS ALL

System ENPUBS is currently running PRIMOS rev. 21.0
 Copyright (c) Prime Computer, Inc., 1985
 8192K bytes memory in use

User SYSTEM

ENPUBS

File Unit	File Position	Open Mode	File Type	RWLock	Treename
COMO	000009650	w	DAM	NR-1W	<PLEIST>CMDNCO>PRIMOS.COMO
31	000000110	w	DAM	NR-1W	<PLEIST>DSM*>LOGS>PRIMOS>LOGREC

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Device	User name			Usrnum	Ldevice	} III	
MT0	SYSTEM			1	MT0		
MT1	GEORGE			22	MT7		
		Device	Total-Lines		Bad-Lines		} IV
Controller	Type	Address	Async	Sync	Async	Sync	
ICS2	F-01	10	32	0	0	0	
MDLC	5646	50	0	4	No Information		} IV
AMLC	DMQ	52	16	0	No Information		
LHC300		56	No Information		No Information		
LHC300		32	No Information		No Information		
Disk	Ldev	Pdev	System		} V		
PLEIST	0	2460					
OLIGOC	1	51460					
PRECAM	2	3022					
HOLOCN	3	61022					
PLIOCN	4	101022					
ORDOVI	5	TEK2					
SILUR	6	MKTG					
DEVON	7	MKTG					
PERMI	10	MNFG.A					
.	.	.			} V		
.	.	.					
.	.	.					
.	.	.					
LIBRY	353	ADMIN			} VI		
AOCTG	354	ADMIN					
PAYROL	355	ADMIN					
Sem.	Value	Users					
- 32	1				} VI		
- 16	177777						
- 15	1						
65	0	1					
66	1	143					
.	.	.					
.	.	.					
.	.	.					
120	0	141					
121	0	141					
122	0	1					

Full duplex network

Node	State
ENPUBS	****
MX.B	Up
TELENET	Up

Ring network

Node	State
ENPUBS	****
TEK2	Up
MKTG	Up
MNFG.A	Up
MNFG.B	Up
RES1	Up
RES2	Down

Route-through network

Node
BELD1
AUS1
MRA.B
BELD3

Public data network

Node
ATHNS
CNBER
RIO.A

IEEE 802.3 networks

Node	State
EN.P86	****
EN.P87	Up
EN.D63	Down

Node	State
EN.P86	****
EN.P87	Down

NTS is currently started
 NTS config file <PNMPRJ>NTS*>NTS.CONFIG

VII

PAGING PARTITIONS

1 100461
2 100463

Comdev = 2460

VIII

User	No	Line oct(dec)	Devices
SYSTEM	1	asr	<PLEIST> ALO77 MTO DK2460
CRUSTN	5	3(3)	<PLEIST>
ASH	7	5(5)	<PRECAM>
IRVING	9	7(7)	<PRECAM> (to MKTG)
VITAE	10	10(8)	<PRECAM>
BANYON	12	12(10)	<PLEIST>
GEORGE	22	24(20)	<PRECAM> TEK2<ORDOVI> MT7
MANNY	30	2000(1024)	<PRECAM>
TNBAUM	63	rem	<PRECAM> <PLEIST> (from RES1)
FMLY	64	rem	<PRECAM> (from TELENET)
ELEMEN	65	rem	<PLEIST> TEK2<ORDOVI> (from TEK2)
PLKTN	84	slave	<PLEIST>
NTS_SERVER	96	ncm	<PRECAM>
LOGIN_SERVER	97	LSr	<PLEIST> (3)
NETMAN	98	nsp	<PLEIST>
PRIMIX_PM	99	phant	<PLEIST> (3)
YTSMAN	100	phant	<PLEIST>
FTP	101	phant	<PLEIST>
BATCH_SERVICE	102	phant	<PLEIST> (2)
SYSFRT	103	phant	<PLEIST> PRO
TIMER_PROCESS	104	kernel	<PLEIST>
DSMNETSR	140	phant	<PLEIST>
DSMSR	141	phant	<PLEIST>
DSMASR	142	phant	<PLEIST>
SYSTEM_MANAGER	143	SMSr	<PLEIST>
AUDITOR	143	Audit	<PLEIST> (3)

IX

OK,

Description of STATUS Information: The following list describes the information presented in the example of the STATUS command. Each numbered section below corresponds to its bracketed section in the example.

Section

Information

- I The system name, the version of PRIMOS currently in use, the copyright notice for PRIMOS, and the size of main memory in kilobytes.
- II At the supervisor terminal, the user ID is always SYSTEM, followed by the local system name (in this case ENPUBS). Next is a list of all open file units. (The COMOUTPUT file PRIMOS.COMO is open.)

SectionInformation

The log file <PLEIST>DSM*>LOGS>PRIMOS>LOGREC is open on file unit 31.

- III List of magnetic tape devices currently assigned. Column 1 (Device) gives the physical device number. Column 2 (User name) gives the user ID of the user to whom the device is assigned. Column 3 (Usrnum) gives the user number. Column 4 (Ldevice) gives the logical device number assigned by the user to the physical device (using the -ALIAS option of the ASSIGN command). If the user did not assign a logical number, Ldevice is the same as Device.
- IV List of communications controllers. Column 1 (Controller) gives the name of the controller, such as AMLC, ICS1, ICS2, ICS3, or MDLC. Column 2 (Type) identifies the controller by type such as DMQ (AMLC controllers), downline load file number (ICS controllers), or PROM-set ID number (MDLC). Column 3 (Device Address) gives the device address in octal. Column 4 (Total-Lines) gives the total line count for asynchronous and synchronous lines, including inoperable lines. Column 5 (Bad-lines) lists the number of failed lines.
- V List of partitions currently started up. Column 1 (Disk) is the name of the partition (also the name of the DSKRAT file). Column 2 (Ldev) is the logical device number associated with the physical device by the ADDISK command. You can add a maximum of 238 partitions (0 through '355) to a system. Logical device 0 must be the command device. The paging partitions are not necessarily included in this list (see VIII) if users cannot directly access them. Column 3 (Pdev) is the physical device number indicating the drive unit, controller, partition size, and offset. (See the Operator's Guide to File System Maintenance.) A blank means that the partition is on a remote system. Column 4 (System) lists the network node on which the partition is physically mounted; a blank means that it is mounted on the local system.
- VI Semaphore information. Semaphores with negative numbers are reserved for and used by PRIMOS and its utilities; semaphores 1 through 64 are numbered semaphores (no access control); semaphores 65 and above are named semaphores to which numbers have been assigned, and the user numbers of users who have access to the semaphores. (See the Subroutines Reference Guide, Volume III for details on named and numbered semaphores.)

<u>Section</u>	<u>Information</u>
VII	Under PRIMOS, multiple network types may be in operation simultaneously. This section indicates those types currently in use. The node name is given along with the state of that node, either Up (in operation) or Down (not in operation). The local node is indicated by ****.
VIII	The physical device numbers of the paging partitions (as many as eight) and the command device, COMDEV. COMDEV is the partition at logical device 0 at the time of system startup. This information is available only if you issue the STATUS command at the supervisor terminal.
IX	List of users currently logged in to the system. Column 1 (User) is the user ID of the user. Column 2 (No) is the user number. The user number is a decimal number and is usually the line number (in decimal) plus 2. Column 3 (Line) is the asynchronous line number of the user terminal in octal (oct) and decimal (dec). Special keywords are shown below.

<u>Line</u>	<u>Meaning</u>
asr	User 1 or the supervisor terminal using the USRASR command
Audit	Security Monitor auditor process
batch	Batch job
child	Child process (spawned by PRIMIX)
kernel	Timer Process (TIMER_PROCESS)
ncm	NTS connection manager
LSr	Login Server (LOGIN_SERVER)
nsp	Network Server process (NETMAN)
phant	Phantom user
rem	User logged in remotely from another node in the network
rts	Route-through Server (RT_SERVER)

SectionInformationLineMeaning

slave Network Process Extension (NPX)
 slave

SMSr DSM System Manager Server

Column 4 (Devices) lists all partitions and assigned devices in use by a particular terminal. A partition is considered to be in use if it contains the user's origin, home, or current directory, or if the user has any files open on that partition. Assigned devices are indicated with the same device abbreviations that the ASSIGN command uses (such as PRO and MT2), except that assigned asynchronous lines are shown by an AL number and assigned partitions by a DK number.

Column 4 information may also include

- Remote logins to another system on the network (see user 9 in example)
- Remote logins from another system on the network (see users 63, 64, and 65)
- User priority (default user priority is 1, which is not displayed; user 102 is running at priority 2, while users 97 and 99 are running at priority 3)
- Use of a remote partition (see user 65)

The STATUS Command From a User Terminal

When issued from a user terminal, STATUS without an option (that is, typing STATUS only) and STATUS ALL display slightly different information. Using STATUS without an option on a user terminal omits information about other users, assigned tape drives, and communications controllers.

The STATUS Command From the Supervisor Terminal

The STATUS command works somewhat differently at the supervisor terminal than at user terminals. At the supervisor terminal, the STATUS ALL output lists information that does not appear when you use the STATUS ALL command from a user terminal. This information includes

the number of bytes of memory in use, negative semaphore values, and the physical device numbers of the command partition and the paging partitions. If you monitor system status from a user terminal, keep this difference in mind.

The TIMER_PROCESS Phantom

At Rev. 21.0 PRIMOS uses a new phantom for timing purposes. This phantom runs under the name TIMER_PROCESS, and its type is listed in a STATUS USERS command output as kernel.

This phantom starts up automatically at cold start when system time is established (by the SETIME command if there is no battery clock). For details on the SETIME command see the Operator's Guide System Commands. This phantom runs automatically. Therefore, you need not be concerned with starting it up or shutting it down.

When to Use STATUS

Some typical uses for the STATUS command are

- To determine what physical disk assignments are available prior to creating a new partition.
- To ensure that a new partition is available after it has been added to the system.
- To determine that all users have finished using a given partition before you shut it down.
- To determine if a system process is running. For example, if users cannot log in, use the STATUS USERS command to determine if the login server is running.
- To check that all users have logged out before you shut down PRIMOS. (If any users are still logged in, you can log them out with the LOGOUT ALL command.)

Issuing the STATUS SYSTEM Command

When you issue the STATUS SYSTEM command from the supervisor terminal, the system displays a message similar to the following:

OK, STATUS SYSTEM

System SYSA is currently running PRIMOS rev. 21.0.
4096K bytes memory in use.

If you are using disk mirroring on any of your local partitions, the STATUS DISKS command also displays a table of mirroring information. If you issue the STATUS ALL command at the supervisor terminal, mirroring information is displayed for paging partitions; otherwise it is not. The output format in either case is the same as in the following example:

Disk	Ldev	Pdev	System	Mirror		
				Primary	Secondary	State
ADMINS	0	4420		4420	4622	Active
PURCHS	1	124421		124421	124623	Active, copying
HUMRES	2	23625		23423	23625	Inactive, primary off
ACCTGS	3	14321		14321	14327	Inactive, secondary off
PAYROL	4	14121				
MAINT	5	124721		124721	124723	Active, copy needed
ENGRG1	6		SYSB			
BLDGS	7		SYSB			
GRNDS	10		SYSB			

The physical device number (pdev) of the primary mirrored partition is listed in the Pdev column, unless a problem on the primary partition has caused an automatic switch to the secondary partition. In that case, the secondary partition's pdev is displayed under Pdev. The status of each mirrored partition, Active or Inactive, is shown in the State column. This status indicates which partitions are being used. Active, copying means that a catch-up copy is in progress and Active, copy needed means that a catch-up copy is necessary but the catch-up copy process is not running yet.

For an explanation of disk mirroring, see the Operator's Guide to File System Maintenance.

THE LIST_QUOTA COMMAND

Use the LIST_QUOTA command for metering disk usage. The command displays the following information about a directory:

- The quota on the directory. The quota determines the maximum number of records that can be stored in the directory (including any subdirectories). If the quota is zero (0), the maximum number of records that can be stored in the directory is determined by the quota on the directory's parent directories and/or the capacity of the disk.
- The total number of records used by the directory and its subdirectories. The total cannot exceed the quota.
- The total number of records used by the directory, not including the records used by subdirectories.

To use LIST_QUOTA, you must have List (L) access to the target and parent directories, and Use (U) access to any higher level directories. If you do not have these rights, you can set a priority ACL (using the SET_PRIORITY_ACL command) to give yourself List and Use access to all directories on the partition.

Format of LIST_QUOTA

The format of the LIST_QUOTA command is

```
{ LIST_QUOTA } [pathname] [-BRIEF]
{ LQ }
```

pathname is the name of the directory for which you want quota and record usage information. If you do not specify a name, information is displayed about your current directory.

If you omit the -BRIEF option, the data is displayed in three lines. If no quota has been set on the directory, the first line is a message stating that the directory is not a quota directory.

The -BRIEF option (abbreviated -BR) displays the data on one line with one-word labels (Max, Used, and Records) for each statistic. The directory name, if given with the command, is listed after the Records field. For nonquota directories, the -BRIEF option does not display the nonquota message, but rather gives the maximum number of records as zero.

LIST_QUOTA Examples

The following two examples illustrate the LIST_QUOTA command.

The first example shows quota and record usage information for STATS, a quota subdirectory contained in the top-level directory PROJ1:

```
OK, LIST_QUOTA PROJ1>STATS
```

```
Maximum records allowed on "PROJ1>STATS" = 500,  
Total records used = 425.  
Records used in this directory = 28.  
OK,
```

The output shows that 500 is the maximum number of records that can be used by the directory STATS and all of its subdirectories. Of these 500 records, 425 have already been used, leaving the directory (and all the subdirectories) 75 records before the directory tree exceeds its

quota. The directory STATS itself, not counting its subdirectories, has used 28 records of the total 425 records used.

The second example is identical to the first, with the addition of the -BRIEF option:

```
OK, LIST_QUOTA PROJ1>STATS -BRIEF
Max:      500, Used:      425, Records:      28, PROJ1>STATS
OK,
```

THE AVAIL COMMAND

AVAIL reports utilization of disk space for local or remote partitions. For any specified partition, the AVAIL command displays

- The size of the partition (that is, the total number of records that the partition can store)
- The number of records still available for use
- The percentage of records used

Data from AVAIL can be shown for all partitions that are currently started (including remote partitions), for a single named partition, or for a partition identified by a logical device number.

The format of the AVAIL command is as follows:

```
AVAIL [disk_id] [-NORM]
```

disk_id is one of the following:

<u>Disk_ID</u>	<u>Meaning</u>
name	Displays information on the local or remote partition called <u>name</u> .
-LDEV n	Displays information on the partition with the logical device number of <u>n</u> , which is a decimal number. To determine <u>n</u> , use the STATUS DISKS command to display logical device numbers in octal and then use the TYPE [OCTAL n] command to convert the octal number to decimal.
	Displays information on all started partitions listed in the SYSTEM>DISCS file.

If you do not specify disk_id, information is displayed for the partition to which you are currently attached.

Records used can be shown in two formats: physical records or normalized records. The default output gives the number in terms of physical records. A physical record contains 2048 bytes. The term physical record is used because 2048 bytes is the size of each slot for a user-data record on the disk. (Actually, each disk record requires identification data that makes the total size of each disk record 2080 bytes.)

The -NORM option displays the information in normalized records for compatibility with pre-Rev. 19.0 systems. Prior to Rev. 19.0, AVAIL and other PRIMOS utilities (such as FUTIL, SIZE, and SPOOL) sized files in terms of normalized records. Normalized records contain 880 bytes.

The following example illustrates the system display when you invoke AVAIL on a partition named STAFF3:

```
OK, AVAIL STAFF3
  Volume STAFF3
    88884 total records
    29967 records available
    66.3% full
```

OK,

The output lists the partition name (after "Volume"), the size of the partition (88,884 records), the total number of records that are available for use (29,967), and the percentage of records used (66.3).

The AVAIL * Format

The AVAIL * format is particularly useful because it displays data, in tabular form, for all partitions connected to the system.

The AVAIL * command works by reading information from a file named DISCS, which must be stored in the SYSTEM top-level directory. When the SYSTEM>DISCS file exists, issuing the AVAIL * command displays the file's contents. For each partition that is actually running, AVAIL * also gives information on space usage. For other partitions, a message appears indicating that the partition is not running.

To make AVAIL * work, you (or the System Administrator) must take the following steps:

1. Use a text editor (such as ED or EMACS) to create a file named DISCS in the directory SYSTEM.

2. Place information on each of the system's partitions within the DISCS file. If the system is networked, you may also include information on remote partitions. The DISCS file must contain one or more columns of text, as follows:
 - The first column contains the names of all partitions to be listed, one per line.
 - The other columns may contain any other information on each of the partitions. Such information may include (in any order) the logical device number, the physical device number (for local partitions), the name of the system to which a remote partition is physically connected, or the fact that a partition is write-protected.
3. Give users List and Read access to the DISCS file.
4. Update the file as needed, to keep it current with your system's actual usage of disks.

The following example shows the contents of a DISCS file and the output from an AVAIL * command that uses that file:

```
OK, SLIST SYSTEM>DISCS
CLOUDS  0    460
FOREST   1  12060
OCEAN    2  52061
HILLS    3  22062
PLAINS   4  61463
OK, AVAIL *
```

Volume ID	Total recs	Free recs	% Full	Comments
CLOUDS	14814	376	97.5	0 460
FOREST	59256	909	98.5	1 12060
OCEAN	66663	31017	53.5	2 52061
HILLS	59256	32765	44.7	3 22062
PLAINS	51849	30316	41.5	4 61463

Exceeding Disk Space

If the AVAIL command shows that your system is frequently running out of disk space, you may need more or larger disks. If you have several partitions, and only one or two of them regularly exceed a 95.0 percentage figure (in the %FULL column), ask your System Administrator about increasing the size of these partitions. (The System Administrator, however, should be sure not to make any of the other partitions too small.) You must also take care not to reformat a disk that is in use, because its data will be lost. (For further

information on disks, see the System Administrator's Guide, Volume I: System Configuration or the Operator's Guide to File System Maintenance.

THE USAGE COMMAND

USAGE activates a system metering utility that anyone can use at any terminal. The information that USAGE generates describes the status and performance of the CPU and other system internals. You can generate a sequence of one or more USAGE samples automatically or manually.

USAGE is especially useful to the System Administrator because it can determine the degree to which individual users and processes are using system resources and thus affecting system performance. Use the USAGE command to check your system when it is working well. The information USAGE provides can later be compared to the results obtained by USAGE if your system begins running poorly.

USAGE can provide both brief and long forms of display. The USAGE command can also monitor remote systems, as long as the remote system is also running at least Revision 19.3.

Automatic Sampling

Automatic sampling allows you to observe system performance at equal sampling intervals. The USAGE program automatically times each interval, which you specify, and displays new information at the end of each interval.

To enable automatic sampling, you must use the -FREQ option to specify the sampling interval. The sampling interval should be at least 30 seconds.

You may also use the -TIMES option to specify how many samples are to be taken. Because the results of the first sample are never displayed, you must specify a -TIMES argument of one greater than the number of samples you want displayed. If you specify the -FREQ option but not the -TIMES option, sampling continues indefinitely.

An example of the command to invoke automatic sampling follows:

OK, USAGE -FREQ 1800 -TIMES 10

In this example, you ask PRIMOS to monitor the system 10 times, with an interval of 1800 seconds (30 minutes) between each sampling.

USAGE would run for a period of 5 hours (1800 seconds x 10 samples / 3600 seconds per hour = 5 hours) and display the results of 9 comparisons between samples.

Manual Sampling

Manual sampling allows you to choose each sample interval individually. The intervals do not have to be identical, but each should be at least 30 seconds.

Manual sampling is the default sampling mode. To use manual sampling, you must not specify the -FREQ or -TIMES options. You may specify other options to request different forms of USAGE's display. These options are listed in the next section.

With manual sampling, USAGE collects the first sample right away and displays a prompt message. From then on, USAGE takes and displays a sample each time you enter a START command. (The START command does not have options.)

After taking and displaying each sample, USAGE pauses and returns you to command level, allowing you to enter other commands. The following example invokes manual sampling with an abbreviated output form:

```
OK, USAGE -BRIEF
[USAGE 21.0] (C) Prime Computer, Inc., 1986.
Type "START" to continue.
```

```
OK, START
```

Remote Sampling

Remote sampling allows you to sample a remote node. You can request either long or brief displays and choose either automatic or manual sampling. The remote system's network must be configured to allow your system to have remote file access, and the remote system must be a Rev. 19.3 or later system.

An example of the command to invoke remote sampling follows:

```
OK, USAGE -FREQ 60 -TIMES 5 -ON GOLD
[USAGE 21.0] (C) Prime Computer, Inc., 1986.
Type "Start" to continue.
```

```
OK, START
```

In the example, statistics from system GOLD would be displayed.

USAGE Command Format and Options

The format of the USAGE command is as follows:

USAGE [options]

If you issue USAGE without options, manual sampling and the -USER option are the defaults. Select options in any order from the following list.

<u>Option</u>	<u>Description</u>
-ALL	Displays system, per-user, and disk metering information at each sample time. The default is -USER.
-BRIEF	Displays a shortened form of output. The brief form presents an overview of which processes and users are consuming system resources. The default long form produces additional information.
-DEBUG	Displays a detailed USAGE version number.
-DISK	Displays system and disk metering information at each sample time.
-FREQ n	Selects automatic sampling every <u>n</u> seconds. <u>n</u> must be an integer in the range 1 through 32767. It is recommended that <u>n</u> be greater than or equal to 30. If -FREQ is not specified, manual sampling is used. If you use this option, also specify the -TIMES option, or sampling continues indefinitely.
-ON nodename	Displays information for the remote system named <u>nodename</u> . The remote system must be configured for RFA and must be running PRIMOS Rev. 19.3 or later.
-TIMES n	Specifies the total number of samples to be taken if automatic sampling is in effect (by using the -FREQ option). The command terminates after <u>n</u> sets of data have been printed. <u>n</u> must be an integer in the range 1 through 32767. If you do not specify -TIMES with -FREQ, sampling continues indefinitely.
-USER	Displays system and per-user metering information at each sample time. This is the default mode of operation.

USAGE Data Display

The USAGE screen display is divided into three sections:

- System meter displays (appearing in the top portion of the USAGE display)
- User meter displays (appearing after the system meter displays)
- Disk meter displays (optionally appearing at the bottom of the USAGE display)

All percentages that appear in the USAGE display are based on elapsed or CPU time in the last sampling interval, unless otherwise stated.

An example of the long form of data display is shown in Figure 2-1. Explanations of symbols follow in the next three sections.

Note

Processes may accumulate CPU time without actually being logged in. Such processes are displayed in the USAGE output with a blank space in the User column. Make sure that these processes are not the result of dangling cables (that is, asynchronous lines that are not connected to a device). If such a line is not properly terminated, disable the line by setting the TTYNOP protocol on it with the SET_ASYNC command, as in the following example:

```
SET_ASYNC -LINE decimal-linenum -PROTOCOL TTYNOP
```

Normally, the line number is the user number minus 2. For the SET_ASYNC command, specify the line number in decimal.

OPERATOR'S GUIDE TO SYSTEM MONITORING

OK, USAGE -ALL

[USAGE 20.2] (C) Prime Computer, Inc., 1985.

Type "START" to continue.

OK, START

31 Aug 86 12:39:34.72 dTIME= 30.78 CPU= 5.14 I/O= 0.00
Up since 30 Aug 86 06:11:40 Saturday CPUtot= 5959.09 I/Otot= 2142.96

%CPU	%Idl1	%Idl2	%Error	%I/O	%Ovlp	IO/S	PF/S
16.68	77.98	0.00	1.68	0.00	0.00	0.00	0.29

%Clock	%FNT	%MPC	%PNC	%SLC	%GPPI	%DSK
0.77	0.00	0.00	0.25	0.00	0.00	0.01

%AMLC	%Async	%Sync	%ICS	Segs	Used	Pages	Used	Wired
0.56	2.06	0.00	0.28	8192	809	4096	4093	343

Locate	%Miss	%Found	%Same	%Share	Loc/S	LM/S
72	0.00	51.39	48.61	0.00	2.34	0.00

Blki/o	Read	%Read	Write	%Write	Awrite	%Awrite	Blk/S
0	0	0.00	0	0.00	0	0.00	0.00

Disk	Qwaits	%Qwait	DMAovr	%DMAovr	Hangs	%Hang	Asyio	%Asyio
0	0	0.00	0	0.00	0	0.00	0	0

Usr	UserID	Mem	Wire	Segs	CPUtime	dCPU	%CPU	I/Otime	dI/O	%I/O
1	SYSTEM	1661	326	153	47.547	0.005	0.017	224.668	0.000	0.000
13	SHELOB	6	1	15	35.908	0.041	0.133	12.956	0.000	0.000
15	MARY	365	1	30	206.096	1.117	3.629	43.136	0.000	0.000
23	GOLLUM	181	1	19	324.228	0.096	0.313	74.728	0.000	0.000
34	BILL.B	437	1	35	272.127	3.109	10.099	79.468	0.000	0.000
148	NETMAN	3	1	5	242.474	0.257	0.835	4.128	0.000	0.000
149	RT_SERVER	8	1	8	6.234	0.007	0.023	1.824	0.000	0.000
151	SYSTEM	23	1	10	28.687	0.045	0.146	20.112	0.000	0.000

					Total	Total	Avg time
Disk	Count	%Count	Time	%Util	%Count	%Util	(msec)
'26	0	0.00	0.00	0.00	45.34		
0	0	0.00	0.00	0.00	45.34	1.94	16.53
'22	0	0.00	0.00	0.00	7.61		
0	0	0.00	0.00	0.00	7.61	0.32	16.38
'27	0	0.00	0.00	0.00	2.17		
0	0	0.00	0.00	0.00	2.17	0.09	16.56
'23	0	0.00	0.00	0.00	44.88		
0	0	0.00	0.00	0.00	44.88	2.35	20.28

OK,

USAGE Example
Figure 2-1

Definitions of System Meter Displays

The following list defines the system meter screen displays invoked by the USAGE command:

<u>Label</u>	<u>Definition</u>
dTIME	The number of real seconds elapsed between the previous sample time and the current sample time.
CPU	The number of CPU seconds charged to all user processes in the current sampling interval.
I/O	The number of I/O (disk) seconds charged to all user processes in the last sampling interval.
Up since	The date and time when the system was last cold started.
CPUt _{tot}	The number of CPU seconds charged to all user processes since cold start.
I/O _{tot}	The number of I/O (disk) seconds charged to all user processes since cold start.
%CPU	The percentage of dTIME time during which CPU time was charged to user processes. This time can be loosely interpreted as the percentage of useful utilization of the CPU.
%Idl ₁	The percentage of idle CPU time in the last sampling interval. (On a P850, this figure is the percentage of master ISU idle time.) This value can be roughly interpreted as the percentage of total CPU time not used or available for additional user processing.
%Idl ₂	The percentage of idle CPU time for the P850 slave ISU in the last sampling interval. This number is always zero on non-P850 configurations.
%Error	The percentage of CPU utilization not otherwise accounted for, and presumed taken by interrupts, scheduler overhead, process exchange, and similar operations. This value can be negative if one or more processes have been overcharged with respect to CPU time.
%I/O	The average percentage of dTIME of all controllers during which I/O (disk) was charged to user processes. This value can be loosely interpreted as the percentage of time disk I/O was in progress.

<u>Label</u>	<u>Definition</u>
%Ovlp	An estimate of the amount of I/O (disk) traffic that has been overlapped with non-idle CPU time during the last sampling interval.
IO/S	The average I/O (disk) request rate in operations per second, over the last sampling interval.
PF/S	The average page fault frequency in faults per second, over the last sampling interval.
%Clock	The percentage of CPU time used by the realtime clock service process.
%FNT	The percentage of CPU time used by the P850 slave ISU realtime frontstop process.
%MPC	The percentage of CPU time used by the MPC (printer, punch, reader) processes.
%PNC	The percentage of CPU time used by the PRIMENET Node Controller process.
%SLC	The percentage of CPU time used by the SMLC process.
%GPPI	The percentage of CPU time used by the General Purpose Parallel Interface (GPPI) processes.
%DSK	The percentage of CPU time used by disk driver processes.
%IOK	The percentage of CPU time used by the LAN300 controller.
%NTS	The percentage of CPU time used by the NTS process.
%AMLC	The percentage of CPU time used by the AMLC process.
%Async	The percentage of CPU time used to service asynchronous lines connected to ICS controllers.
%Sync	The percentage of CPU time used to service synchronous lines connected to ICS controllers.
%ICS	The total percentage of CPU time used to service the ICS controllers on the system.
Segs	The number of segments configured for the system.

<u>Label</u>	<u>Definition</u>
Used	The total number of segments present at the end of the last sampling interval.
Pages	The number of pages in main memory minus mapped-out pages.
Used	The total number of pages used at the end of the last sampling interval.
Wired	The number of wired pages during the last sampling interval.
Locate	The total number of calls made in the last sampling interval to the file system associative buffer manager, LOCATE.
%Miss	The percentage of calls to LOCATE in the last sampling interval that resulted in a disk read being performed. (This percentage represents LOCATE misses.)
%Found	During the last sampling interval, the percentage of calls to LOCATE that found the desired record already in the associative buffers, not including %Same or %Share.
%Same	The percentage of calls to LOCATE in the last sampling interval to access the same record that the process had just located.
%Share	The percentage of calls to LOCATE in the last sampling interval for a record that was already in use by another process.
Loc/S	The LOCATE use rate in calls per second, over the last sampling interval.
LM/S	The LOCATE miss rate, in misses (disk reads) per second, over the last sampling interval.
Blki/o	The total number of block mode calls made in the last sampling interval. Pertains to ROAM users only.
Read	The number of block mode reads in the last sampling interval. Pertains to ROAM users only.
%Read	The percentage of block mode reads in the last sampling interval. Pertains to ROAM users only.
Write	The number of block mode writes in the last sampling interval. Pertains to ROAM users only.

<u>Label</u>	<u>Definition</u>
%Write	The percentage of block mode writes in the last sampling interval. Pertains to ROAM users only.
Awrite	The total number of block mode asynchronous calls in the last sampling interval. Pertains to ROAM users only.
%Awrite	The percentage of block mode asynchronous calls in the last sampling interval. Pertains to ROAM users only.
Blk/S	The average number of block mode calls per second. Pertains to ROAM users only.
Disk	The total number of disk I/O operations performed in the last sampling interval.
Qwaits	During the last sampling interval, the number of times that a process had to wait to get a disk request block allocated.
%Qwait	The percentage of disk I/O requests, during the last sampling interval, that required waiting for a disk request block.
DMAovr	The number of disk operations, during the last sampling interval, that resulted in DMA overrun errors.
%DMAovr	The percentage of disk operations, during the last sampling interval, that resulted in DMA overruns.
Hangs	The number of disk operations, during the last sampling interval, that caused the disk controller to hang and time out.
%Hang	The percentage of disk operations, in the last sampling interval, that caused controller hangs.
Asyio	The total number of asynchronous writes made to disk. Pertains to ROAM users only.
%Asyio	The percentage of asynchronous writes made to disk. Pertains to ROAM users only.

Definitions of User Meter Displays

The following list defines USAGE's user meter displays. Keep in mind that if a user logs in or out during a sampling interval, incorrect meter values may result. Some caution must therefore be used in interpreting the per-user metering data. Take samples with at least a 30-second interval between samplings.

<u>Label</u>	<u>Definition</u>
Usr	The user number.
UserID	The user's user ID (login name). If this name is too long to fit in the column, the name is displayed and the remaining information is listed on the following line.
Mem	The total number of pages resident in memory at the time the page control data bases were examined. These physical pages belong to the user's segments (Segment numbers 0 through '3777 are charged to User 1.) This value can be taken as a rough estimate of the demand the user is placing on virtual memory management. If the system is paging at a reasonably high rate, this value can also approximate the size of the user's average working set, over reasonably short intervals.
Wire	The number of wired pages used by this user at the end of the last sampling interval.
Segs	The number of segments used by this user at the end of the last sampling interval.
CPUtime	The CPU time, in seconds, used by this user since login.
dCPU	The CPU time, in seconds, used by this user during the last sampling interval.
%CPU	The percentage of total CPU time used by this user during the last sampling interval.
I/Otime	The I/O (disk) time, in seconds, used by this user since login.
dI/O	The I/O (disk) time, in seconds, used by this user during the last sampling interval.
%I/O	The percentage of realtime (over the last sampling interval) during which I/O (disk) was in progress for this user.

Definitions of Disk I/O Displays

The disk I/O displays invoked by USAGE with the -DISK option are listed below, with their definitions:

<u>Label</u>	<u>Definition</u>
Disk	The octal controller I/O address and the disk drive unit number.
Count	The number of disk I/O operations for that controller or unit in the last sampling interval.
%Count	The percentage of total disk I/O operations in the last sampling interval performed by that controller or unit.
Time	The time (including seek time, rotational time, and transfer time), in seconds, spent performing I/O operations on the specified controller or unit during the last sampling interval.
%Util	The percentage of disk I/O time spent performing I/O on that controller or unit during the last sampling interval.
%Total Count	Percentage of the total count of I/O operations done on the drive since cold start. For the controller, it is the sum of the drives attached.
%Util Total	Percentage of the total time each drive has been busy since cold start.
Avg time (msec)	The average time in milliseconds for each I/O operation on the drive since cold start.

Interpreting USAGE Reports

USAGE is a diagnostic tool for determining where the problem lies when system performance seems lower than normal. Three major resources in a Prime system are the CPU, the disks, and memory. Any of these can become a bottleneck. Systems experiencing these bottlenecks are described as CPU-bound, I/O-bound, or memory-bound, respectively.

The following paragraphs describe what to look for if your system has performance problems. All of the following symptoms assume that system performance is slow and response is bad. This section also suggests some solutions to these problems.

Note

Always check with your System Administrator before making any changes to system hardware or any adjustments to system scheduling parameters.

CPU-bound Systems: A CPU-bound system may exhibit these symptoms:

Symptom: %Idl1 (and %Idl2 on an 850) is consistently less than 1.

Solutions:

- Inform your System Administrator, who may wish to contact your marketing System Analyst about upgrading the CPU after further analysis determines that other possible causes, such as malfunctioning controllers or other hardware problems, are not responsible for CPU overutilization.
- Use the CHAP command to give higher priorities and longer timeslices to interactive users. Decreasing the eligibility slice with the ELIGTS command favors shorter transactions.
- Identify user processes that are using most of the CPU, by looking at the %CPU column in the per-user report. Your System Administrator may be able to optimize particular programs and make them more efficient.

Symptom: %Idl1 (and %Idl2 on an 850) is less than 10% and the sum of the system process percentages is high (greater than 20% to 30%).

Solutions:

- Check the %Aml number. If it is consistently greater than 10%, then check the following:
 - Make sure that the baud rate on the last line of the last AMLC board is not greater than 300 baud.
 - Check for unterminated lines (lines that are not connected to devices). Either connect devices to them or disable them with the SET_ASYNC or AMLC commands, using the TTYNOP protocol.
 - Make sure that cables, modems, or terminals are not generating spurious characters.

- Have a representative from your Customer Support Center check the controllers. A controller may be causing spurious interrupts or it may be configured improperly.

Symptom: Performance is slow, yet %Idl1 (and %Idl2 on an 850) is greater than 10% and %I/O is less than 60%.

Solutions:

- Raise the value of MAXSCH (see the Operator's Guide to System Commands) until the system begins to page heavily to allow more users to execute concurrently.
- Have a representative from your Customer Support Center determine whether system data bases are creating a bottleneck.

I/O-bound and Memory-bound Systems: When a system is memory-bound, it tends to become I/O-bound.

Symptom: %I/O is over 60% to 70%, and %Idl1 (and %Idl2 on an 850) is greater than 10%.

If both these conditions exist, your system may be I/O-bound. Check the additional symptoms listed below to determine a course of action.

Symptom: PF/S is greater than 10-15. (This number may vary, depending on your processor.)

Solutions:

- Your System Administrator may wish to add more memory.
- Lower the value of MAXSCH to reduce the number of concurrent processes.
- Add a disk drive and use an alternate paging partition on this drive. If you already have more than one disk drive, begin using the PAGING configuration directive.
- Use the PRATIO command to change the paging ratios of the paging partitions. See the Operator's Guide to System Commands for a discussion of the PRATIO command.
- Reduce the working set of PRIMOS by making the values of configuration directives (such as NSEG, NTUSR, and AMLBUF) as small as possible.

- Check the Mem column of the USAGE per-user report. Your System Administrator may wish to modify and re-order the load sequence of certain applications to reduce the working set.

Symptom: %Miss is consistently higher than 20%.

Solutions:

- Edit the configuration file and increase the value of the NLBUF configuration directive. Do this only if the system is not paging excessively.
- Your System Administrator may want to add another disk drive.
- Check the I/O time column of the per-user USAGE report. Your System Administrator may wish to try to reduce the number of I/O requests made by certain applications.

Symptom: The %Util in the disk report is 60% or greater for one drive.

Solution:

- Move directories and/or paging partitions to disks that are not heavily accessed.

3

DSM and System Event Logging

This chapter describes the mechanics of event logging and the products with which you can administer the day-to-day operation of Prime systems. The subjects introduced are as follows:

- Distributed System Management (DSM)
- Event and Network Logging
- New System Event Messages

DISTRIBUTED SYSTEM MANAGEMENT

The Prime Distributed System Management (DSM) is an integrated set of products and services designed to assist you in monitoring single and networked Prime systems. This section gives a brief overview of DSM. For further details, see the DSM User's Guide.

DSM provides networked systems management, thus allowing you to administer and control machines collectively from any convenient point on the network. It simplifies tasks such as resource monitoring and event logging. DSM is designed primarily to help in the management of networked systems, but is also useful at single-node installations.

Primarily, System Administrators and system operators use DSM. It provides the following systems management facilities.

- Networked event message handling. The Unsolicited Message Handler (UMH) redirects event messages to log files, users, or assigned devices, according to preset rules. In conjunction with DSM logging, the UMH provides an event logging mechanism.
- Networked message logging. The DSM logging service records messages and information from all DSM applications in either private or system logs anywhere on the network. You can administer, display, and print these logs on any system. The `DISPLAY_LOG` command, which formats and displays these logs, is described later in this chapter.
- Remote systems-level machine control. The RESUS (Remote System User) command allows access to the supervisor terminal on any machine, from any terminal on the network. The RESUS command is described in Chapter 1, MONITORING THE SYSTEM.
- Networked system status monitoring. The System Information and Metering (SIM) commands provide this monitoring. See Chapter 4, SYSTEM INFORMATION AND METERING COMMANDS, for information on using these commands.

Startup and Operation of DSM

To use DSM and the processes activated by the facility, such as system logging, you need to perform the following steps:

1. Start up DSM.
2. Configure DSM.
3. Distribute configuration file to all nodes in the configuration group.
4. Configure Unsolicited Message Handling (UMH).
5. Shut down DSM.

The `START_DSM` command brings the Distributed System Management facility up on the system. `START_DSM` is normally included in the `PRIMOS.COMI` file. You must start up DSM to enable system logging and event message handling. In addition, System Information and Metering (SIM) commands and the RESUS command work only if DSM is started.

The `CONFIG_DSM` command invokes a utility that you use to create the DSM configuration file. This file establishes the identity of the configuration group and defines the access control policy within the group.

The `DISTRIBUTE_DSM` command copies a master configuration file to all nodes in a configuration group, or to a specific node or node group.

You can also use this command to remove a node from a configuration group and operate that node under the default configuration.

The `CONFIG_UM` command allows you to configure the way in which event messages are selected and routed. For example, you may select messages to be channeled, based on their origin, destination, and severity. You may also choose to route messages to users, log files, or devices throughout a configuration group.

`STOP_DSM` logs out all DSM server processes. You can issue this command only from the supervisor terminal.

Refer to the DSM User's Guide for a complete description of these procedures and commands.

EVENT AND NETWORK LOGGING

Every Prime computer contains a system event logger. An event logger is a software utility that automatically records, in a disk file, information about significant system events. Such events include cold and warm starts, machine checks, disk errors, and the setting of priority ACLs.

The output from the event logger can be useful in tracking system problems, especially those that develop or worsen over a period of time. Therefore, format and print the event log file periodically to monitor the events on the system.

You are also responsible for maintaining a system logbook. The logbook, which consists of handwritten entries in a book, usually contains information about external events that can cause problems, such as power failures. The primary purpose of the system logbook is to allow backtracking if a problem occurs. The contents and format of the logbook are defined by the System Administrator. For information on logbook formats and contents, see the Operator's System Overview or the System Administrator's Guide, Volume III: System Access and Security.

At Rev. 21.0, system event logging and network event logging are done through a new specialized DSM logging service, based on delivery of all event messages to the DSM Unsolicited Message Handler (UMH). The service provides a facility for logging DSM messages in private user logs or in system logs. These logs can be situated anywhere on the network. This logging service also provides utilities for administering and displaying such logs.

Rev. 21.0 system event logs are kept in the directory called `DSM*>LOGS>PRIMOS`. Network event logs are kept in `DSM*>LOGS>NETWORKS`.

DSM must be running in order for system and network event logging to work. The procedure for starting and configuring DSM is explained in the DSM User's Guide.

WARNING

If you invoke the `FIX_DISK` command on the partition on which private log files are located, logging is disabled for the directory holding the log files. The messages are recorded in an undelivered log (`DSM*>LOGS>UMH>UNDELIVERED.LOG`), instead. However, if you are running `FIX_DISK` on the partition where `DSM*` is located, all logging is disabled and no messages are recorded. Refer to the Operator's Guide to File System Maintenance.

Event messages are appended to the appropriate file. In the case of cyclic log files, new messages overwrite the oldest messages in the file when the file is full. If the log file is linear, however, new messages are lost when the file gets full. Therefore, it is good procedure to review your log files on a regular basis to avoid losing any messages. You can purge log files with the `-PURGE` option to the `DISPLAY_LOG` command. In addition, you can select messages from log files by origin, time logged, or severity.

Note

The `DISPLAY_LOG` command does not work on pre-Rev. 21.0 log files. To read pre-Rev. 21.0 log files, refer to Appendix A, `PRE-REV. 21.0 SYSTEM EVENT LOGGING`.

Administering and Controlling Event Logs

All Prime event logs at Rev. 21.0 are DSM logs, and are administered by the general DSM log management utility `ADMIN_LOG`. Through `ADMIN_LOG`, you can create and customize event logs to suit your own system requirements by setting appropriate values for log file attributes. The options to `ADMIN_LOG` allow you to perform the following tasks:

- Create DSM logs and specify their attributes, including size
- Modify the attributes of existing logs
- List the attributes of existing logs
- Purge the logs of unwanted messages
- Delete logs

The format of the `ADMIN_LOG` command is

`ADMIN_LOG logname [options]`

The ADMIN_LOG command has the following options:

<u>Option</u>	<u>Description</u>
{ -PRIVATE_LOG -PLOG }	Creates a private log in any directory to which you have access. You can specify the pathname of the private log to which you have access rights. You must also have access to the DSM function PRIVATE_LOGGING on the system where the private log file resides. If you do not specify PRIVATE_LOG, a system log is assumed. You cannot specify this option and the -SYSTEM_LOG option on the same command line.
{ -SYSTEM_LOG -SLOG }	Creates a system log in the system logging directory, DSM*>LOGS. The pathname you specify is assumed to be in this directory. To access a system log, you must have access to the DSM function SYSTEM_LOGGING. You cannot specify this option and the -PRIVATE_LOG option on the same command line.
<u>-CREATE</u> attributes	Creates a DSM log. For a description of log file attributes, see the following section on specifying log attribute options.
<u>-MODIFY</u> attributes	Changes the attributes of a log. You can also append new values for any attributes on the command line.
-PURGE [{ age } { ALL }]	Allows you to delete messages that are older than a specified number of days. For example, if you specify an <u>age</u> of 1, all messages that are more than one day old are deleted. Permitted arguments are ALL, zero and any integer in the range 1 through 365. If you specify an <u>age</u> of zero, or the keyword ALL, all messages in the log are deleted. If you do not specify a value for <u>age</u> , the current retention time is assumed. If the current retention time is infinite, no messages are deleted, and an error message is displayed.
<u>-DELETE</u>	Deletes a DSM log.

<u>Option</u>	<u>Description</u>
-LIST	Displays the attributes of a log, its current size, and the age of the oldest message.
-HELP $\left[\begin{array}{l} \{-NO_WAIT\} \\ \{-NW\} \end{array} \right]$	Gives you information on how to use the command. If you specify -NO_WAIT, the display is not paginated at your terminal. This option cannot be used with the other options.
-USAGE	Displays the command syntax in brief. This option cannot be used with the other options.

The following log attribute options may be used with the ADMIN_LOG command.

<u>Attribute</u>	<u>Description</u>
$\left\{ \begin{array}{l} \{-MAXIMUM_SIZE\} \\ \{-MXSZ\} \end{array} \right\}$ records	Sets the maximum size of the log in terms of disk records (2 Kbytes). Permitted values are zero and 1 through 32767. A value of zero is interpreted as an unlimited size. The default is 10 records.
$\left\{ \begin{array}{l} \{-MINIMUM_SIZE\} \\ \{-MNSZ\} \end{array} \right\}$ records	Sets the minimum size of the log in terms of disk records (2 Kbytes). Permitted values are 1 through 32767. The default is one record.
$\left\{ \begin{array}{l} \{-WARNING_LEVEL\} \\ \{-WL\} \end{array} \right\}$ percent	Defines an arbitrary level at which messages are generated warning you that the log is approaching its maximum size. Warning level is expressed as a percentage of the maximum size in disk records, and can only be used where a maximum size has been set for the log. Default is undefined.

<u>Attribute</u>	<u>Description</u>
$\left\{ \begin{array}{l} \text{-CYCLIC} \\ \text{-LINEAR} \end{array} \right\}$	Sets the log as cyclic or linear. The default is cyclic. For a discussion of both types of log, refer to the <u>DSM User's Guide</u> .
<u>-RETAIN</u> days	Defines how many days messages are to be held in the log before being deleted. Permitted values for days are zero and 1 through 365. If you specify zero, messages are retained indefinitely (infinite retention time). In logs with infinite retention time, messages are held until the log is deleted, the log is purged manually, or, for cyclic logs, until new messages overwrite older ones in the log. The default is infinite retention time.
$\left\{ \begin{array}{l} \text{-PURGE_TIME} \\ \text{-PTIM} \end{array} \right\}$ hh:mm	Defines the time of day when DSM purges the log. It must be in 24-hour format. The default is 01:00 (1 a.m.) All logs have a purge time set. In logs with infinite retention time, the purge time is never used.

All event messages after Rev. 21.0 are DSM unsolicited messages, and can be routed to log files, users, and assigned lines through an appropriate UMH selection. Use the CONFIG_UM command to configure the UMH. See the DSM User's Guide for more information on CONFIG_UM and its options.

Displaying Your Log Files

At Rev. 21.0, you can display your system and network log files with the DISPLAY_IOG command. It allows you to select messages from logs by various criteria, and to display them at your terminal or write them to a file.

DISPLAY_IOG, a Distributed System Management (DSM) command, replaces the PRINT_SYSLOG and PRINT_NETLOG commands at Rev. 21.0. START_DSM, explained earlier in this chapter, enables you to invoke DISPLAY_IOG, which allows you either to display all or part of a log at your terminal, or to write it to a file. You can select messages from the log by their origin (product/user/node), severity, and the time they were logged. Message selection is particularly useful in conjunction with DSM event logging.

The format for this command is

$$\text{DISPLAY_LOG} \left\{ \begin{array}{l} \text{input_log_file} [\text{output_log_file}] [\text{options}] \\ \text{-HELP} \\ \text{-USAGE} \end{array} \right\}$$

Except when using the -HELP and -USAGE options, you must always give an input_log_file name.

The DISPLAY_LOG command has the following options:

<u>Option</u>	<u>Description</u>
output_filename $\left[\left\{ \begin{array}{l} \text{-NO_QUERY} \\ \text{-NQ} \end{array} \right\} \right]$	Writes a log to a named partition file. If you use the -NO_QUERY option, you are not notified if you overwrite an already existing file.
$\left\{ \begin{array}{l} \text{-PRIVATE_LOG} \\ \text{-PLOG} \end{array} \right\}$	Allows you to define the log as a private log. If you do not specify -PRIVATE_LOG, a system log is assumed. You cannot specify this option and the -SYSTEM_LOG option on the same command line.
$\left\{ \begin{array}{l} \text{-SYSTEM-LOG} \\ \text{-SLOG} \end{array} \right\} \left[\left\{ \begin{array}{l} \text{node} \\ \text{nodegroup} \end{array} \right\} \right]$	Defines the log as a system log, which is the default. If you do not specify a node or nodegroup, the local node is assumed. You cannot specify this option and the -PRIVATE_LOG option on the same command line.
$\text{-FORMAT} \left\{ \begin{array}{l} \text{BRIEF} \\ \text{FULL} \\ \text{format_name} \end{array} \right\}$	Allows you to choose several display formats: BRIEF gives you the message data in summary format, and is most suitable for unsolicited messages. For messages containing substantial amounts of information, such as SIM response messages, FULL, or tabulated, formats are preferred.

<u>Option</u>	<u>Description</u>
	FULL gives you a dump of the contents of all the fields and records in the message. FULL format reflects the internal structure of the message and may require skilled interpretation.
	<u>format_name</u> allows you to specify one of the tabular formats available for use on PRIMOS or PRIMENET logging messages. Refer to the <u>DSM User's Guide</u> for detailed information on custom formats.
{ -NO_HEADER -NOH }	Suppresses all header information except the date/time stamp. The format of the message data display is unaffected. This option only applies to the default brief format and has no effect if you use the FORMAT -FULL option.
{ -NO_WAIT -NW }	Presents the messages in a continuous stream. You can suspend and resume output by using the PRIMOS XON/XOFF feature. The default is output in screen pages.
-CENSUS	Gives you a count of each message type in the log. The messages themselves are not displayed.
-HELP	Explains how to use the command. Overrides other options. If you use the -NO_WAIT option with this command, the display is not paginated at your terminal.
-USAGE	Gives you the command syntax in brief. This option overrides other options.

Message Selection Options: In addition to the above options, you can specify a maximum of ten of the several message selection options listed below. Particular options can occur more than once, with the exception of the -LOGGED_AFTER and -LOGGED_BEFORE options. If you select no message selection options, all messages in the log are displayed.

You can extract specific messages for display by the following selection criteria:

- The origin of the message (-PRODUCT, -USER, and -NODE)
- The severity of the message (-SEVERITY)

- The time the message was logged (-LOGGED_AFTER, -LOGGED_BEFORE)
- The type of message (-MESSAGE_ID)

<u>Message Selection Option</u>	<u>Description</u>
<u>-PRODUCT</u> names	Retrieves messages generated by a particular product. The default retrieves messages from all products. The following is a list of DSM products:

DSM	STOP_DSM
ICS	LOGGER
START_DSM	LOG_COLD
SIM	CONFIG_DSM
LOG_SEG4	RESUS
STATUS_DSM	LOG_DISK
ADMIN_LOG	DISTRIBUTE_DSM
LOG_UNKN	DISPLAY_LOG
CONTROLLER_DLL	LOG_OVFL
SCREENHANDLER	CONTROLLER_ULD
NMSR	CONFIG_UM
SYSTEM_MANAGER	PRIMENET

For details about DSM products, refer to the DSM User's Guide.

{ -MESSAGE_ID } type	Retrieves messages of a particular type. For a complete listing of the message types recognized by DISPLAY_LOG refer to the <u>DSM User's Guide</u> . The default is to return messages of all types.
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-NODE nodes	Lets you specify a list of PRIMENET nodes from which messages are to be displayed. Default is to return all messages.
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<u>-SEVERITY</u> severities	Allows you to select messages of particular severities, useful in conjunction with unsolicited messages from PRIMOS or PRIMENET. Refer to the <u>DSM User's Guide</u> for further information.
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Message Selection OptionDescription

-USER usernames

Lets you specify a list of usernames from whom messages are to be displayed.

Note

Remember that PRIMOS user names are not necessarily unique on the network; there may be two users named SMITH, for example, one on node SILVER and one on GOLD. If you want to retrieve messages from SMITH on SILVER, you must specify both username and PRIMENET node.

-REMARK remark

Allows you to place a remark on the log, with as many as 160 characters. All characters typed after the -REMARK option are entered into the file. Therefore, -REMARK must be the last option on the command line.

{ -LOGGED_AFTER } [date/time]
-LAF

Allows you to select messages logged after a specific date and time. The format for date/time can be

- YY-MM-DD.HH:MM:SS (ISO)
- MM/DD/YY.HH:MM:SS (USA)
- DD Mmm YY HH:MM:SS (Visual)

{ -LOGGED_BEFORE } [date/time]
-LBF

Allows you to select messages that were logged before a specific date and time. Formats for date/time are identical to those for -LOGGED_AFTER.

If you specify LAF or LBF without any arguments, all messages that have been received since the start of the day are displayed.

Note

Options -IAF and -LBF select messages on the date/time they were logged, rather than when they were generated. These times may differ because of the transmission time over the network, especially if messages are logged on distant nodes. Where messages are directed to nodes in different time-zones, the date/time reflects these differences.

SYSTEM EVENT MESSAGES

The following messages may appear in the event log output file. These system event messages inform you about the status of the system. Each message is preceded by a two-line header, indicating the product sending the message, the username, nodename, severity, and time logged. The following is an example of a typical message header:

***Message from product LOG_COLD Rev 1, generated by AMOS on ENPUB2
(Severity Information, logged at 04 Mar 87 16:16:48 (Wednesday))

- BAD ENTRY: <xxxxxxx> ... (OCT).

An entry of unrecognized type or of a length longer than 81 halfwords was encountered. An octal dump of the entry is provided for the number of words contained in the length field.

- BUFFER OVERFLOW -- <xxxxxx> MESSAGES LOST, <bbbbbbb> BYTES LOST

xxxxxx (decimal) messages were lost and bbbbbbb bytes were lost because of overflow of the system log buffer (LOGBUF). Most likely, the same error has caused so many other errors that the event log buffer overflowed. The entries lost are probably only repeated entries of those already listed.

- COLD START PRIMOS REV <rr> CPU TYPE = <cpu>
MICROCODE REV = <mm>
PROCESSOR ID = <iiiiii>...(OCT)

A cold start of PRIMOS was performed. rr is the PRIMOS rev. number. cpu is the type of CPU. mm is the revision of the microcode running. The cold start entry contains eight halfwords of information (iiiiii) obtained from the STPM (STore Processor Model number) instruction.

- The Cyclic log: <pathname> is now full;
<nn> messages overwritten.

This message results when a cyclic log file is full. New messages overwrite the old messages. To avoid overwriting old messages, use a linear limitation to the log file. Or use the DISPLAY LOG command to review the log file frequently. Refer to the DSM User's Guide for setting up parameters on your log files.

- Disk download file <filename> not found (disk_init).

An attempt was made to downline load an intelligent controller. The correct download file was not found. Specify correct download file filename.

- DISK ERROR IN IOOP MODE: OPCODE=<oooooo> (OCT) DEVICE NUMBER=<dddddd dddddd>
(<cccc> CTRLR <n>)
CRA = <aaaaaa aaaaaa> (OCT)
CYLINDER = <c> HEAD = <h> RECORD = <r> (typecode)
LSW = <llllll llllll> (OCT) PSW = <pppppp pppppp> (OCT) ECC RESIDUE = <eeeeee eeeee>
(INTERRUPT TYPE = <ttttt> (OCT) REQUEST_ID = <iiiiii> (OCT))

A disk error occurred in Intelligent Channel Order Protocol (IOOP) mode. This can happen when the system downloads the intelligent controller and the controller fails to enter intelligent mode. This indicates a hardware problem, for example, a download to controller revision mismatch, or a controller memory problem.

- DISK <jj> ERROR, DEVICE NUMBER = <pdev> (OCT)
(typecode)
CRA = <aaaaaa aaaaaa> (OCT)
CYLINDER = <xxx> HEAD = <xx> RECORD = <xx> RCRA = <xxxxxxxxxxxx> (OCT).
STATUS (ACCUM) = <ssssss> (OCT) STATUS (LAST) = <llllll> (OCT) RETRIES = <nn>
WORD NUMBER = <wwwww> (OCT) CORRECTION = <cccccc cccccc> (OCT) <yy>

A disk read-error or write-error occurred during the indicated operation. jj indicates READ or WRITE. pdev indicates the physical device number. typecode indicates controller number and device type (SM = Storage Module, Disk Cartridge Module, Device, or Fixed-Media Disk). aaaaaa aaaaaa shows the error's record address. The cylinder, head, and record addresses are given in decimal. xxxxxx xxxxxx is the current record address read on a CRA error and is given for read operations only.

ssssss is the Boolean OR of all status bits obtained during retries. llllll is the status of the last operation. nn is the number of retries attempted.

yy is "(CORRECTED)" if the operation was completed successfully. yy is "(UNCORRECTED)" if the error could not be corrected. If the error has been successfully corrected by the software, the line displays correction information. wwwww indicates the record's corrected halfword number. cccccc indicates the 32-bit correction pattern.

- DISK MIRROR BROKEN. Primary = <p> (OCT) Secondary <s> (OCT)

This error occurs when the system Copy Server attempts an uncorrectable read from both disks in the mirror. Because the Copy Server cannot read from either disk, it logs out, thus breaking the mirror.

- DISK MOUNT: <partition_name> ON <pdev> (OCT)

An ADDISK or STARTUP command was issued. partition-name was mounted on the disk identified as pdev.

- ERROR CHECK: <text>

PRIMOS has encountered one of the following four types of error checks:

- Wired Ring 0 Stack Overflow (ROOVR)
- Unwired Ring 0 Stack Overflow (PAGES_)
- Paging Disk Error During Unwired 0 Page Fault (PAGES_)
- Paging Disk Full During Ring 0 Page Fault (PAGING_DEVICE_FULL\$)

All of these result in a Forced Shutdown Halt.

- FAILURE TO ENTER INTELLIGENT CONTROLLER MODE.
CONTROLLER = <C> (OCT)

The system downloaded to the intelligent controller. However, the controller failed to enter Intelligent mode. This indicates a hardware problem, for example, a download to controller revision mismatch or a controller memory problem.

- FORCED SHUTDOWN!

PRIMOS has encountered a problem and performed a Forced Shutdown Halt. This is an orderly shutdown. Refer to the handbook for your CPU.

- I/O Errors while processing a disk DLL file <file name>(disk_init).

Unable to read downline load file filename. filename is either IDC1.DL or IDC2.DL.

- MACHINE CHECK MODE NOW QUIET

PRIMOS entered quiet machine check mode. This action occurs after 1024 ECCC (correctable memory errors) and causes subsequent ECCC errors to go unreported in order to prevent filling up the system event log file.

- MACHINE CHECK (<xxx>) DSWSTAT= <ssssss ssssss> DSWRMA= <yyyyy>
<rrrrrr rrrrrr> DSWPB= <pppppp pppppp>
[DSWPARITY <xxxxxxx xxxxxx> ...]

A machine check occurred. Information regarding the Diagnostic Status Word (DSW) at the time of the check is indicated by DSWSTAT, DSWRMA (DSW Real Memory Address at last machine check), DSWPB (DSW Procedure Base at last machine check), and DSWPARITY.

If the RMA INVALID bit is set (bit 9 of DSWSTATL), yyyyy is (INV); otherwise yyyyy is absent.

DSWPARITY is not present on all CPU models and Prime systems. If DSWPARITY is not present, xxx is an encoding of the machine-check code (and not RCM Parity) in DSWSTAT as follows:

<u>xxx</u>	<u>Description</u>
BMA	Memory address
BMD	Memory data output
BPAI	Peripheral address input
BPAO	Peripheral address output
BPD	Peripheral data output
RCD	Cache data
RCM	RCM parity error (XCS only)
RDXI	RDX-BPD input
RF	Register file

9655 and Similar Machine Check Messages

The information listed below pertains to the following machines: The 750™, 850™, 2350™, 2450™, 2455™, 2550™, 2655™, 2755™, 9650™, and 9655™ systems.

Refer to the following section, 6350 and Similar Machine Check Messages for an interpretation of errors for machines of that type.

If DSWPARITY is present, it is broken down by the reporting board (A, C, CS, J) and the signal name, as in the following example. (All signals are reported in the positive sense. For example, if RCMPE is printed, it means that the signal RCMPE- was 0.)

DSWPARITYH

01 - RPARERR1+	CS	DMX input E6: BPD or Burst- R0,R2 E5: BPD or Burst- R0,R1,R2,R3 DMX output : BMD
02 - RPARERR2+	CS	DMX input E6: BPD or Burst- R1,R3 E5: BPD DMX output : BMA
03 - FBDMX+	CS	Burst-mode DMX transfer
04 - BURST-INPUT+	CS	1=DMX input, 0=DMX output
05,06,07 - 0 - FPDPE+	D	Peripheral reports BPD error (output)
1 - FBRFHPE+	D	Base Register File High
2 - FMDPE+	D	Memory reports BMD error (write)
3 - FIPBAPE+	D	Prefetch Buffer address
4 - FPAPE+	D	Peripheral reports BPA error (output)
5 - FBRFLPE+	D	Base Register File Low
6 - FMAPE+	D	Memory reports BMA error
7 - FIPBIPE+	D	Prefetch Buffer instruction
08 - RCMPE-	A	RCM parity if no board reported error
09 - FMDECCU+	D	Memory reports ECC uncorrectable read-error
10 - GDBDPE-	D	Prefetch board detected error
11 - BPAIPE+	A	BPA input error (DMX or Interrupt)
12 - FRDXPE+	A	RDX error when most recently closed
13 - FRFPE+	A	Register file error
14 - FREAPE+	A	REAH or REAL error
15 - FDMX+	D	DMX cycle at time of error

DSWPARITYL

01 - GCBDPE-	C	C board detected error
02 - FBMDEVPE+	C	BMD input even word
03 - FBMDOODPE+	C	BMD input odd word
04 - LMMOD+	C	Missing memory module at Cache-Miss
05 - LEMAPE+	C	Memory reports BMA error at Cache-Miss
06 - LFERNEXT+	C	LSB address to memory at error (Cache-Miss)
07 - LFLRMAL15+	C	LSB address to memory at start of Cache-Miss
08 - LMISFL16+	C	Indicator of which memory module was activated
09 - LEMDECCU+	C	Memory reports ECC uncorrectable on Cache-Miss
10 - LEMDECCC+	C	Memory reports ECC correctable on Cache-Miss
11 - LRCIAPE+	C	Cache-Index error on Cache-Read
12 - LRCDOODPE+	C	Cache-Data-Odd word error on Cache-Read
13 - LRCDEVPE+	C	Cache-Data-Even word error on Cache-Read
14 - LFSERVDEB-	C	Purpose of Cache cycle: 1=Execute, 0=Prefetch

6350 and Similar Machine Check Messages

The information listed below pertains to the following machines: The 2755P™, 6350™, 9750™, 9755™, 9950™, 9955™, 9955P™ and 9955II™ systems.

Refer to the previous section, 9655 and Similar Machine Check Messages for an interpretation of errors for machines of that type.

If DSWPARITY is present, it is broken down by the reporting board and the signal name as follows.

DSWPARITYH

01 - Set if ROC parity error; if set, bits 3 through 8 are set as

- 03,04,05 - Encoding of ROC parity error bits 1-8
- 06 - Boolean OR of ROC parity error bits 1-8
- 07 - ROC parity error bit 9
- 08 - Reset (0)

02 - Set if I/O parity error; if set, bits 3 through 8 are set as

- 03 - Set if error is in left byte of BPA or BPD
- 04 - Set if error is in right byte of BPA or BPD
- 05 - Set if CPU detected a parity error on BPD
- 06 - Set if CPU detected a parity error on BPA
- 07 - Set if controller detected a parity error on BPD
- 08 - Set if controller detected a parity error on BPA

03 -

04 -

05 - Depends on whether either bit 1 or bit 2 is set

06 - See description of bits 1 and 2 above for specifics

07 -

08 -

09 - Currently unused

10 - Set if E1 board detected a parity error on BEH, left byte

11 - Set if E1 board detected a parity error on BEH, right byte

12 - Set if E1 board detected a parity error on BEL, left byte

13 - Set if E1 board detected a parity error on BEL, right byte

14 - Set if E1 board detected a parity error on BAH

15 - Set if E1 board detected a parity error on BAL

16 - Set if E1 board detected a parity error on BAE

DSWPARITYL

- 01 - Set if memory control unit detected a parity error on BD; if set, bits 4 through 7 are set to indicate the error location as
 - 04 - BDH left byte
 - 05 - BDH right byte
 - 06 - BDL left byte
 - 07 - BDL right byte
- 02 - Set if memory control unit detected a latched memory data error; if set, bits 4-7 are set to indicate the error location as
 - 04 - LMDH left byte
 - 05 - LMDH right byte
 - 06 - LMDL left byte
 - 07 - LMDL right byte
- 03 - Set if memory control unit detected a latched memory address error; if set, bits 4-7 are set to indicate the error location as
 - 04 - MCADDR high byte
 - 05 - MCADDR low byte
 - 06 - MCADDR extended byte
 - 07 - Currently unused
- 04 -
- 05 - Depends on whether either bit 1, 2, or 3 was set
- 06 - See description of bits 1, 2, and 3 above for specifics
- 07 -
- 08 - Set if memory control unit detected an EOC uncorrectable error
- 09 - Set if unit I detected an error; if set, bits 10-12 are set to describe the error as follows:
 - 10,11,12 - 0 - No error
 - 1 - Currently unused
 - 2 - Currently unused
 - 3 - Decode net, right byte
 - 4 - Decode net, left byte
 - 5 - Base register file high
 - 6 - Base register file low
 - 7 - Index register file
- 13 - Set if S unit detected an error; if set, bits 14-16 are set to describe the error as follows:
 - 14,15,16 - 0 - PID or STLB control bits
 - 1 - LBPA out of STLB in error
 - 2 - Cache index, right side
 - 3 - Cache index, left side

- 4 - Cache data, high side
- 5 - Cache data, low side
- 6 - LBVA out of STL in error
- 7 - Branch cache parity error

- MISSING MEMORY. DSWSTAT = <ssssss ssssss> (OCT). DSWRMA = <yyyyy rrrrrr rrrrrr> (OCT). DSWPB = <pppppp pppppp> (OCT). [DWPARTY = <xxxxxxx xxxxxx> (OCT)]

A missing-memory check occurred. DSWSTAT, DSWRMA, DSWPB, and DSWPARTY give information regarding the Diagnostic Status Word (DSW) at the time of the check. DSWPARTY is not displayed for all Prime systems.

If the RMA INVALID bit is set (bit 9 of DSWSTATL), yyyyy is (INV). Otherwise, yyyyy is absent.

- MEMORY PARITY (www) DSWSTAT= <ssssss ssssss> (OCT). DSWRMA= <yyyyy rrrrrr rrrrrr> (OCT). DSWPB= <pppppp pppppp> (OCT). [DSWPARTY= <xxxxxxx xxxxxx> (OCT)]
PHYSICAL PAGE NUMBER = <nnnnnn> (OCT), WORD NUMBER = offset (OCT).
REAL ADDRESS = <aaaaaaaa> (OCT). [CACHE ADDRESS = <cccccc> (OCT)]

A memory parity error occurred. www is either ECC CORRECTED or ECC UNCORRECTED. DSWPARTY is displayed but not decoded. For a corrected error, nnnnnn is followed by "Bit = y," where y indicates the bit in error (1-16 = bits 1-16; LP = left parity; RP = right parity; C2, C4, C5 = other check bits; MB = multibit; NE = no error). This is followed by OVERALL PARITY = x, where x is 0 or 1, and reflects the setting of DSWSTATL bit 6.

- POWER FAIL CHECK

A power fail check occurred.

- PRIORITY ACL set on disk <diskname> by user <nn> (user <username>)

A priority ACL was set on partition diskname. nn is the decimal number of the user who set the ACL and username is the name of that user.

- <Text of operator remark>

The text is the contents of the REMARK event, generated by use of the -REMARK option to PRINT_SYSLOG.

- SETIME COMMAND ISSUED

The SETIME command has been issued from the supervisor terminal.

- SHUTDOWN BY OPERATOR

The operator issued a SHUTDN ALL command. (This event causes the system log buffer to be automatically dumped.)

- SHUTDOWN DUE TO CHECK FROM SENSORS.
REGISTER 26: <stat1 stat2> (OCT)

A sensor check occurred and caused the loading of register 26 with the sensor status data (stat1 stat2) and the shutting down of the system. Possible causes for this are

BOARD TEMPERATURE TOO HIGH.
CABINET TEMPERATURE TOO HIGH.
LOW AIR FLOW.
UPS BATTERY LOW.

- TYPE = <tt>. DATA= <dddddd> ... (OCT).

An input file entry of types 10 through 15 was encountered. tt is the type of entry. dddddd is a display that can contain a maximum of nine halfwords of information from the entry.

- USER <user_number> LOGGED OUT DUE TO A MEMORY PARITY ERROR.

The user process caused a memory parity error, or ECCU. PRIMOS logged out the process and continued normal operation.

- WARM START

A warm start of PRIMOS was performed.

4

System Information and Metering Commands

System Information and Metering (SIM) is a group of commands that collects and presents system information. Several commands provide access to information not previously available, while others overlap, but do not replace, the information generated by the system-monitoring STATUS command.

The DSM facility must be running in order for the SIM commands to work. DSM is explained briefly in Chapter 3, DSM AND SYSTEM EVENT LOGGING. For complete information on DSM, refer to the DSM User's Guide.

SIM commands allow system operators, System Administrators, and knowledgeable users to obtain information about the state and performance of a network of computer systems. Because these commands offer a view of the whole network, they provide data for system control of that network, whereas the STATUS command gathers information about individual systems.

This chapter lists the fifteen SIM commands, as follows, and then provides an explanation of each command, along with its command format and options.

SYSTEM INFORMATION AND METERING (SIM) COMMANDS

<u>Command</u>	<u>Description</u>
LIST_ASSIGNED_DEVICES	Lists assigned devices (printers, and so forth)
LIST_ASYNC	Lists state and configuration of asynchronous terminals
LIST_COMM_CONTROLLERS	Lists configuration of communications controllers
LIST_CONFIG	Lists PRIMOS configuration directives
LIST_DISKS	Lists logical disks (partitions)
LIST_LAN_NODES	Lists systems on LAN300 local networks
LIST_MEMORY	Lists physical memory usage
LIST_PRIMENET_NODES	Lists PRIMENET configured systems
LIST_PRIMENET_LINKS	Lists PRIMENET status
LIST_PRIMENET_PORTS	Lists ASSIGNED PRIMENET ports
LIST_PROCESS	Lists system processes
LIST_SEMAPHORES	Lists semaphores in use
LIST_SYNC	Lists synchronous line configuration
LIST_UNITS	Lists any user's open file units
LIST_VCS	Lists active virtual circuits

General SIM Options

You can use the general SIM options described in this section with any SIM command.

<u>Option</u>	<u>Description</u>
-ON { node nodegroup }	Allows you to specify the <u>node</u> or <u>nodegroup</u> to which the command is to be directed. The default directs the command to the <u>node</u> on which the command is invoked.

<u>Option</u>	<u>Description</u>
$\left\{ \begin{array}{l} \text{-PRIVATE_LOG} \\ \text{-PLOG} \end{array} \right\} \text{ logname [-NTTY]}$	<p>-PRIVATE_LOG allows you to write the information to disk by specifying any standard PRIMOS pathname.</p> <p>You can use -NTTY with the -PRIVATE_LOG and -SYSTEM_LOG options; it indicates that no data is to be displayed to the user.</p> <p>The -NTTY option starts a phantom under your user name. If the command fails, details are logged in a comoutput file in your origin directory. This option requires that the users have WRITE access to their origin directory.</p>
$\left\{ \begin{array}{l} \text{-SYSTEM_LOG} \\ \text{-SLOG} \end{array} \right\} \text{ logname [-NTTY]}$	<p>-SYSTEM_LOG allows you to write the information to a local system log. Specify a pathname including the directory path DSM*>LOGS, but do not give a disk partition.</p> <p>To record System Information Metering output in a private or system log, you must have access to the functions PRIVATE_LOGGER or SYSTEM_LOGGER through DSM security. For details of the differences between private logs and system logs, see the <u>DSM User's Guide</u>.</p> <p>You can use -NTTY with the -PRIVATE_LOG and -SYSTEM_LOG options; it indicates that no data is to be displayed to the user.</p> <p>The -NTTY option starts a phantom under your user name. If the command fails, details are logged in a comoutput file in your origin directory. This option requires that you have WRITE access to your origin directory.</p>
$\text{-HELP} \left[\left\{ \begin{array}{l} \text{-NO_WAIT} \\ \text{-NW} \end{array} \right\} \right]$	<p>Gives you information on how to use the command. Overrides other options. If you specify -NO_WAIT, display is not paginated at your terminal. The same information is available through PRIMOS HELP.</p>

<u>Option</u>	<u>Description</u>
-USAGE	Gives you the command syntax in brief. Overrides other options.
{ -NO_WAIT -NW }	Indicates that you are not to be prompted or queried during the command output display. If this option is not used, you are prompted between each target node's response, and after every 23 lines (1 page) of output display.
-FREQ [seconds]	Provides periodic execution of the command, in multiples of four seconds. The interval you specify is the interval between two successive executions of a command, and not the interval between completion of the command's display and the next execution. Intervals are corrected to the nearest multiple of four seconds less than the specified interval. If FREQ 0 is specified, or if the option is not used, but the others are, the command is reexecuted immediately after the previous execution is complete. If the interval elapses before the previous display is complete, the next execution is delayed until the display is complete. Use option in conjunction with the -TIMES, -START, and -STOP options, to implement periodic execution of a command.
-TIMES [number]	Used in association with the -FREQ option, to set a limit on the number of times that a command is to be executed. Used in conjunction with -START, and -STOP options, to implement periodic execution of a command.
-START [date/time]	Sets the date and time that execution starts. Use of this option implies periodic execution and is often used in conjunction with -TIMES, and -STOP options. The format can be in either ISO standard

(YY-MM-DD.HH:MM:SS)

Option

Description

or USA standard

(MM/DD/YY.HH:MM:SS)

The default is to start immediately.

-STOP [date/time] Sets the date and time execution stops; format is same as for -START. Used in conjunction with -TIMES, and -START options, to implement periodic execution of a command.

In the absence of any of the above four options, the command is executed once, and stopped immediately.

In the presence of any of the above four options, the defaults applied to the unspecified options are

-FREQ Immediate reexecution
-TIMES Infinite
-START Now
-STOP Never

Formatting the SIM Commands

The following section lists each SIM command, its format, and its command-specific options.

► LIST_ASSIGNED_DEVICES [options]

The LIST_ASSIGNED_DEVICES command displays all the devices that have been assigned on a system through the ASSIGN command. (See PRIMOS Commands Reference Guide.)

Command-specific Options: Two command-specific options to this command allow you to specify particular users and particular devices. You can use them singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
device_names	Allows you to specify a list of assignable device_names. Assigned devices not in the list are not displayed.

Use wilddcarding to specify a group of assigned devices. The following example illustrates the use of a wilddcard to list all line printers, paper tape readers, paper tape punches, and plotters that are assigned.

LIST_ASSIGNED_DEVICES P@@

The default is ALL assigned devices.

Assignable devices are

<u>Device Code</u>	<u>Meaning</u>
ASYnn	Asynchronous communications line in the range 00 through 0255. A leading zero is required; for example, ASY08 is acceptable, ASY8 is not.
CARDR	Serial card reader.
CRn	MPC parallel card/reader or reader/punch. <u>n</u> is 0 or 1.
DISKpdev	Physical partition. <u>pdev</u> is a partition (volume) number, specified in octal; put no space between the keyword DISK and the number.
GSO - GS3	Vector General graphics display terminal.
MGO - MG3	Megatek graphics display terminal.
MTh	Magnetic tape unit. <u>n</u> is the physical device number, in the range 0 through 7.

OptionDescriptionDevice CodeMeaning

PRn	Line printer. <u>n</u> is the logical device number, in the range 0 through 7.
PTR	Paper tape reader.
PUNCH	Paper tape punch.
PLOT	Printer/plotter.
SYNCnn	Synchronous communications line. <u>n</u> is in the range 00 through 07. A leading zero is standard format; for example, SYNC07 is acceptable, SYNC7 is not. Line numbers are in decimal.

device names are treated as prefixes, and match all devices that include that prefix. For example,

LIST_ASSIGNED_DEVICES MT

lists all the assigned magnetic tape units from MT0 up to MT7. Similarly,

LIST_ASSIGNED_DEVICES ASY SYNC

lists all AMLC and SMLC devices.

Note

AMLC and SMLC are logical devices. Physical device names such as MDLC, HSSMLC and ICS2 are not permitted.

-USER { names
 numbers }

This option allows you to specify a list of users, by name or number. Assigned devices whose assigning user is not in this list are not displayed.

<u>Option</u>	<u>Description</u>
	Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all users whose name begins with the letter J.

LIST_ASSIGNED_DEVICES -USER J@

The default is ALL users.

► LIST_ASYNC [options]

The LIST_ASYNC command displays the status and configuration of any or all of the system's asynchronous lines. Options allow you to specify particular users and particular lines.

Asynchronous lines can be in one of three modes:

<u>Mode</u>	<u>Meaning</u>
LOGIN	The line is available for login.
ASSIGNED	The line is assigned to a user.
FREE	The line is available for assignment.

This command also displays terminals attached to the Local Area Network (LAN). For further information on assigned lines refer to the AMLC section in the System Administrator's Guide, Vol. II, Communication Lines and Controllers.

Command-specific Options: Two command-specific options determine the subset of information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
line_numbers	Allows you to specify a list of asynchronous <u>line numbers</u> . Lines not specified in this list are not displayed.

OptionDescription

line numbers must be specified as decimal integers, ranging 0 through 32767.

The default is ALL lines.

-USER { names
 numbers }

Allows you to specify a list of user_names and user_numbers. Lines not associated with the specified users are not displayed.

Wildcarding may be used with this option to specify a group of users. The following example specifies all users whose name begins with the letter J.

LIST_ASYNC -USER J@

► LIST_COMM_CONTROLLERS [options]

The LIST_COMM_CONTROLLERS command displays information on communications controllers present in a system, including the LAN Host Controller (LHC), but excluding the Prime Node Controller (PNC). Information is given for each controller and includes the controller name, its type, its device address, the number of synchronous lines attached, and the number of asynchronous lines attached. When you invoke the LIST_COMM_CONTROLLERS command, a display similar to the following is shown on your screen.

```
OK> list_comm_controllers
[LIST_COMM_CONTROLLER Rev. 21.0.B3 Copyright (c) 1987, Prime Computer, Inc.]

** ENPUB2 **
Communication controllers on : ENPUB2
```

Device address	Controller	Device Type/Protocol	Total lines Async.	Sync.	Bad lines Async.	Sync.
'56	LHC	NTS				
'54	AMLC	Direct memory queue	16			

```
OK> como -e
```

This command has no command-specific options.

► LIST_CONFIG [options]

The LIST_CONFIG command displays the cold-start values, default values, and current values of those system variables that can be set by configuration directives at cold start.

The cold-start values are as specified in the configuration file, usually named CONFIG. Default values are those set by PRIMOS when a cold-start value is omitted. Current values may differ from both the cold-start and default values; this difference can either be because PRIMOS allows the cold-start and default values to be modified subsequent to cold start, or because the specified cold-start value was illegal, and PRIMOS has used an alternative upper or lower boundary value, which is not the default value.

The command selects the directives it displays. It does not return values set by the AMLBUF, SMLC, ICS, or LHC directives because these directives are set on a per line, per controller basis, rather than on a system basis, and may in any case be determined by other LIST commands, such as LIST_ASYNC and LIST_SYNC. Further, the command does not return the values of directives that are only significant at cold start, such as VPSD, TYP0UT, or WIRMEM.

Command-specific Option: One command-specific option to the LIST_CONFIG command determines the subset of the information to be displayed. A description of the option follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
directive_names	Allows you to specify a list of <u>directive_names</u> , and displays the cold-start values, default values, and current values of those system variables that can be set by the configuration directives listed; directives are not displayed if they are not specified on the list.
	Use <u>wildcarding</u> to specify a group of directives. The following example illustrates the use of a wildcard to list all directives beginning with the letters IO:

LIST_CONFIG IO@@

For more detailed information on directives, refer to the System Administrator's Guide, Vol. I: System Configuration.

► LIST_DISKS [options]

The LIST_DISKS command displays information for local or remote disks that have been added to the system. For local disks only, it can also display the disks' free record size and the current users' IDs.

Command-specific Options: Four command-specific options to the LIST_DISKS command determine the subset of information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
disk_names	Allows you to specify a list of local or remote <u>disk_names</u> , and displays information for those listed. Disks not specified in the list are not displayed. For remote disks, the system name, logical device number, and locally logged-in users of the disks are displayed. Use <u>wildcarding</u> to specify a group of <u>disknames</u> . The following example illustrates the use of a wildcard to list all <u>disknames</u> beginning with the engineering prefix ENGR that are assigned.
	LIST_DISKS ENGR@@
	If you do not specify <u>diskname</u> , an overview screen is displayed for ALL disks.
-LOCAL	Displays information about local disks only. The default is ALL disks.
-USERS	Displays a list of users on local disks. The default is no display of disk users. Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all users whose name begins with the letter J.

LIST_DISKS -USER J@

<u>Option</u>	<u>Description</u>
-REMOTE	Displays information about remote disks only. If a disk name is specified, this option is ignored. The default is ALL disks.

Note

This option does not allow you to obtain information about users or disk availability on remote disks. To do this, you must use the -ON node option. (See the section, General SIM Options, at the beginning of this chapter.)

► LIST_LAN_NODES [options]

The LIST_LAN_NODES command displays information about the configured LAN300 local area networks.

Command-specific Options: Three command-specific options to the LIST_LAN_NODES command determine the subset of the information displayed. They can be used singly, or the first can be used in combination with either the second or third, but not both, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
<u>LAN_names</u>	Allows you to specify a list of LAN names. <u>LAN_names</u> are the names of the LAN300 networks to which the node is connected. You may use <u>wildcarding</u> to specify a group of LAN network names. The following example illustrates the use of a wildcard to list all production LANs that are assigned.

```
LIST_LAN_NODES PROD@@
```

The default is ALL LAN_names.

<u>Option</u>	<u>Description</u>
<pre>{ -HOST } { -LTS }</pre>	Allows you to specify that only hosts or only LTSs are to be displayed. Options -HOST and -LTS are mutually exclusive. For details of LAN300 hosts and LTSs, see the <u>NTS User's Guide</u> .

► LIST_MEMORY [options]

The LIST_MEMORY command displays current memory usage. It displays the number of segments, resident pages, and wired pages per user process; users are identified by name and number.

Command-specific Options: Two command-specific options to LIST_MEMORY determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
<pre>{ user_names } { user_numbers }</pre>	Allows you to specify a list of <u>user_names</u> or <u>user_numbers</u> . The memory usage of users not specified in this list is not displayed. <u>Wildcarding</u> may be used with this option to specify a group of users. The following example specifies all <u>user_names</u> whose name begins with the letter J.

LIST_MEMORY J@

The default is ALL logged-in users.

<u>-TYPE user_type</u>	Allows you to specify a list of <u>user_types</u> . The memory usage of users who do not constitute one of these types, is not displayed.
------------------------	---

<u>Option</u>	<u>Description</u>
---------------	--------------------

Valid user_types are

```
terminal
remote
slave
server
batch
child
phantom
```

The default is ALL user_types.

► LIST_PRIMENET_LINKS [options]

The LIST_PRIMENET_LINKS command displays the status of PRIMENET links, where a link can be a PRIMENET configured SMLC line, a PRIMENET configured node on a ring, or a LAN300 network. For each link, the command displays the node or public data network to which it is connected, the number of active virtual circuits on the link, and the availability of the link for traffic routing.

Command-specific Options: Two command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
<pre>{ node_names } { PDN_names }</pre>	<p>Allows you to specify a list of <u>node_names</u> or public data network names (<u>PDN_names</u>). Links that do not connect to the listed nodes and networks are not displayed.</p> <p><u>Wildcarding</u> may be used with this option to specify a group of <u>node_names</u> or <u>PDN_names</u>. The following example specifies all <u>node_names</u> beginning with the letters EN.</p>

```
LIST_PRIMENET_LINKS EN@@
```

OptionDescription

The default is all PRIMENET nodes and subnetworks that are directly connected; nodes that are accessible over a PDN or by Route-through are not directly connected and, therefore, do not constitute links.

-LINK link_devices

Allows you to specify a list of link_devices. Links that are not supported on those devices are not displayed.

Three device types are

SYNCnn
PNCnn
LHCnn

where nn is the device number.

Notes

SYNC and PNC are logical devices. Physical device names such as MDLC, HSSMLC, and ICS2 are not permitted.

A system can connect to only a single ring, so that PNC00 is the only permitted PNC device.

Device names are treated as prefixes, and match all devices' names that include that prefix. For example, specifying SYNC is equivalent to specifying SYNC01 through SYNC07. Take care when you use this feature, as SYNC1 does not match SYNC01, but matches SYNC10 through SYNC17, which do not exist. Use SYNC01 in this instance.

The default is ALL link_devices.

Use wildcarding to specify a group of assigned link devices. The following

<u>Option</u>	<u>Description</u>
	example illustrates the use of a wildcard to list all link devices that are assigned.

LIST_PRIMENET_LINKS -LINK @@C@@

For further information on PRIMENET links refer to the Operator's Guide to Prime Networks, and to the System Administrator's Guide, Vol. II: Communication Lines and Controllers.

► LIST_PRIMENET_NODES [options]

The LIST_PRIMENET_NODES command displays all PRIMENET configured remote nodes, the paths to those nodes, and the permitted access to those paths. Several paths can exist to the same node. Possible access modes to a path are

Interprocess Communications Facility (IPCF)
Remote login
Remote File Access (RFA)

Command-specific Options: Two command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
node_names	Allows you to specify a list of remote <u>node_names</u> . Information for nodes not specified in this list is not displayed. Use <u>wildcarding</u> with this option to specify a group of <u>node_names</u> . The following example specifies all <u>node_names</u> beginning with the letters EN.

LIST_PRIMENET_NODES EN@@

OptionDescription

The default is ALL PRIMENET configured remote nodes.

-LINK link_devices

Allows you to specify a list of link_devices. Paths that are not routed on these link_devices are not displayed.

You may use wildcarding to specify a group of assigned link_devices. The following example illustrates the use of a wildcard to list all link_devices that are assigned.

```
LIST_PRIMENET_NODES -LINK @C@@
```

Three devices types are

```
SMLCnn
PNCnn
LHCnn
```

where nn is the device number.

The default is ALL link_devices.

Notes

SMLC, PNC, and LHC are logical devices. Physical device names such as MDLC, HSSMLC, and ICS2 are not permitted.

A system can connect to only a single ring, so that PNCOO is the only permitted PNC device.

Device names are treated as prefixes, and match all device names that include that prefix. For example, specifying SMLC is equivalent to specifying SYNC01 through SYNC07. Take care when you use this feature, as SMLC1 does not match SYNC01, but matches SYNC10 through SYNC17, which do not exist. Use SYNC01 in this instance. For example, if link

Option

Description

Note

SYNCO1 were connected to the TELENET public data network, specifying SYNCO1 as the link device would cause all remote nodes accessible via TELENET to be displayed.

For further information on links, refer to the Operator's Guide to Prime Networks, and the System Administrator's Guide, Vol. II: Communication Lines and Controllers.

► LIST_PRIMENET_PORTS [options]

The LIST_PRIMENET_PORTS command displays a system's port assignments. Processes must assign ports so that they can receive incoming PRIMENET calls on those ports. Information about specific port assignments that you can obtain with LIST_PRIMENET_PORTS is as follows:

- Assign count
- Process number
- Process type
- User name

Notes

Where ports are not specifically assigned by number, LIST_PRIMENET_PORTS displays the user data (udata) information associated with the port, in hexadecimal. For more details about user data, see the Programmer's Guide to Prime Networks.

Slave processes that are not yet assigned appear as not logged in. When these slave processes are being used by remote users, they appear under the remote user name. Unassigned slave processes never appear as logged in.

Command-specific Options: Two command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
port_numbers	Allows you to specify a list of <u>port_numbers</u> . Ports whose numbers are not specified in this list are not displayed. <u>Port_numbers</u> must be specified as decimal integers ranging 0 through 32767. For further information on port assignments, refer to the <u>Operator's Guide to Prime Networks</u> . The default is ALL port numbers.
-USER names numbers	Allows you to specify a list of port <u>user_names</u> or <u>user_numbers</u> . Ports that are not assigned to this list are not displayed. Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all <u>user-names</u> whose name begins with the letter J.

LIST_PRIMENET_PORTS -USER J@

The default is ALL users.

► LIST_PROCESS [options]

The LIST_PROCESS command displays the environment of a user process that you specify. The user process' identity is displayed, together with details of its environment, which includes

- Attach points
- Abbreviation file
- Active COMI and COMO files
- Connect, CPU and I/O times and limits
- Membership in project groups
- All active remote identities

You can obtain other information about a process' environment by using other commands in the SIM set, such as the following:

<u>Information Needed</u>	<u>SIM Command</u>
Asynchronous line status	LIST_ASYNC
Current memory usage	LIST_MEMORY
Identity of open file units	LIST_UNITS
List of active virtual circuits	LIST_VCS
List of assigned devices	LIST_ASSIGNED_DEVICES
Port assignments	LIST_PRIMENET_PORTS
Semaphore values	LIST_SEMAPHORES

Command-specific Options: Four command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
{ usernames } { usernumbers }	Allows you to specify a list of <u>user_names</u> and <u>user_numbers</u> . User processes not specified in this list are not displayed.
	Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all users whose name begins with the letter J.

LIST_PROCESS J@

The default is ALL users.

{ -PROJECT } { -PROJ }	project_groups
	Allows you to specify a list of <u>project_groups</u> . User processes that are not logged in under one of these <u>project_groups</u> are not displayed.
	You may use <u>wildcarding</u> to specify a list of project groups. The following example illustrates the use of a wildcard to list

<u>Option</u>	<u>Description</u>
	all <u>project_groups</u> beginning with the prefix ACCT that are assigned.

LIST_PROCESS -PROJ ACCT@@

The default is ALL project_groups.

-TYPE process_types	Allows you to specify a list of <u>process_types</u> . Users who do not constitute one of these types are not displayed.
---------------------	--

Valid process_types are

terminal
remote
slave
server
batch
child
phantom

The default is to display ALL process_types.

{ -DETAIL } { -DET }	Allows you to specify whether detailed information must be returned for each user ID displayed.
-------------------------	---

The default is to return summary information only, namely

user_number
user_name
user_type
user's project ID

► LIST_SEMAPHORES [options]

The LIST_SEMAPHORES command displays the value of all semaphores in use on the system. The effect of the command is similar to that invoked by the command STAT SEMAPHORES; for further details, see the PRIMOS Command Reference Guide. For detailed information on semaphores, refer to the Subroutines Reference Guide, Volume III.

Command-specific Options: Three command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
semaphore_numbers	Allows you to specify a list of semaphores by number. Semaphores not specified in this list are not displayed. <u>semaphore_numbers</u> must be specified as decimal integers in the range -32 through 32767, where 1-64 is the user range. The default is ALL semaphores.
-USER { names numbers }	Allows you to specify a list of users by name or number. Semaphores opened by users not specified in this list are not displayed. Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all users whose name begins with the letter J. LIST_SEMAPHORES -USER J@@
-TYPE { NAMED NUMBERED }	Allows you to specify that only <u>numbered</u> or <u>named</u> semaphores are to be displayed. The default is to display both <u>named</u> and <u>numbered</u> semaphores.

► LIST_SYNC [options]

The LIST_SYNC command displays the configuration of all enabled synchronous lines. The command does not return the status information, because that is the function of the individual software subsystems that control the line; the subsystems are PRIMENET, RJE, DPTX, and the like.

For a detailed explanation of synchronous lines, refer to the section on SMLC directives in the System Administrators Guide, Vol. II: Communication Lines and Controllers, and the section on synchronous controllers in the Subroutines Reference Guide, Volume III.

Command-specific Option: One command-specific option determines a subset of the information for display. A description of the option follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
line_number(s)	Allows you to list the lines by their logical numbers, and displays the configuration of those lines only. <u>line_numbers</u> must be specified as octal integers, in the range 0 through 77777. The default is to display ALL configured lines.

► LIST_UNITS [options]

The LIST_UNITS command performs one of the following three functions:

- Displays the open file units for any system user
- Displays the ID of all users with either a particular file open, or any file open in a particular directory
- Displays the current attach points of all users on the system

Command-specific Options: Two command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
{ user_names user_numbers }	Allows you to specify a list of <u>user_names</u> and <u>user_numbers</u> . Units for users not specified in this list are not displayed. Use <u>wildcarding</u> with this option to specify a group of users.

Option

Description

The following example specifies all users whose name begins with the letter J.

LIST_UNITS J@@

The default is ALL users.

-PATHNAME pathname_prefix

Allows you to specify a pathname_prefix. Units whose pathnames are not prefixed by, or equal to, the specified pathname are not displayed. The pathname_prefix must start at the level of the partition name; for example <AAA>BBB is a valid prefix, but BBB is not.

The default is the null string that matches all pathnames.

Note

You must use a disk partition name. Logical disk numbers and the character * are not acceptable identifiers for the disk partition.

► LIST_VCS [options]

The LIST_VCS command displays the state of virtual circuits. Used without any options, it displays all active virtual circuits on the system. The five options for this command define subsets of the virtual circuits that you need to display.

Command-specific Options: Five command-specific options determine the subset of the information displayed. They can be used singly, or in combination, to make the subset more specific. A description of the options follows.

See the section General SIM Options at the beginning of this chapter for additional options to this command.

<u>Option</u>	<u>Description</u>
VC_numbers	<p>Allows you to specify a list of active virtual circuit IDs. Active virtual circuits not specified in this list are not displayed. The <u>VC_numbers</u> must be specified as decimal integers in the range 1 through 32767.</p> <p>The default is ALL active virtual circuit IDs.</p>
-USER { names numbers }	<p>Allows you to specify a list of <u>user_names</u> and <u>user_numbers</u>. Virtual circuits of users not specified in this list are not displayed.</p> <p>Use <u>wildcarding</u> with this option to specify a group of users. The following example specifies all users whose name begins with the letter J.</p> <p style="text-align: center;">LIST_VCS -USER J@@</p> <p>The default is ALL system users.</p>
-NODE node_names	<p>Allows you to specify a list of remote <u>node_names</u>. Virtual circuits that do not connect to one of those nodes are not displayed.</p> <p>You may use <u>wildcarding</u> to specify a group of <u>node_names</u>. The following example illustrates the use of a wildcard to list all assigned <u>node_names</u> beginning with the prefix ENP.</p> <p style="text-align: center;">LIST_VCS -NODE ENP@@</p> <p>The default is ALL nodes.</p>
-LINK link_devices	<p>Allows you to specify a list of <u>link_devices</u>. Virtual circuits not supported on these <u>link_devices</u> are not displayed.</p> <p>You may use <u>wildcarding</u> to specify a group of assigned <u>link_devices</u>.</p>

Option

Description

The following example illustrates the use of a wildcard to list all assigned link_devices with the suffix 02.

```
LIST_VCS -LINK @@02
```

Three types of link_device are

```
SMLCnn
PNCnn
LHCnn
```

where nn is the device number.

Notes

SMLC and PNC are logical devices. Physical device names such as MDLC, HSSMLC, and ICS2 are not permitted.

A system can connect to only a single ring, so that PNC00 is the only permitted PNC device.

Device names are treated as prefixes, and match all device names that include that prefix. For example, specifying SMLC is equivalent to specifying SMLC01 through SMLC07. Take care when you use this feature, as SMLC1 does not match SMLC01, but matches SMLC10 through SMLC17, which do not exist. Use SMLC01 in this instance.

If the link SMLC01 is connected to the TELENET public data network, for example, when this link is specified, it displays the state of all the virtual circuits routed via TELENET.

The default is ALL link devices.

<u>Option</u>	<u>Description</u>
-PORT port_numbers	Allows you to specify a list of <u>port_numbers</u> . Virtual circuits that do not use these <u>port_numbers</u> are not displayed. <u>Port numbers</u> must be specified as d ecimal integers in the range 0 through 32767. The default is ALL ports.



APPENDIX



Pre-Rev. 21.0 System Event Logging

Prior to Rev. 21.0, system event logging was accomplished by using the following directives, commands, and directories:

- The LOGREC configuration directive
- The EVENT_LOG command
- The LOGREC* directory
- The PRINT_SYSLOG command

The functions performed by these commands are, at Rev. 21.0, handled by the Distributed System Management (DSM) event logging mechanism. Refer to the DSM User's Guide. However, the DSM event logging mechanism does not work on pre-Rev. 21.0 log files. For your convenience, this appendix describes how to display pre-Rev. 21.0 log files.

Note

If you did not have a pre-Rev. 21.0 version of PRIMOS on your system, you do not have the PRINT_SYSLOG command. This command is not part of the Rev. 21.0 Master Disk. However, if you had the pre-Rev. 21.0 PRINT_SYSLOG command, it is not deleted by the installation of Rev. 21.0. Therefore, this appendix applies to users who still have pre-Rev. 21.0 log files and the PRINT_SYSLOG command.

SYSTEM EVENT LOG FILES

Pre-Rev. 21.0 system event log files are stored in a top-level directory named LOGREC*, which must be present for event logging to take place.

The name of a system event log file is LOG.mm/dd/yy (where mm, dd, and yy numerically represent the month, day, and year when the system was cold started or the EVENT_LOG command was issued). For example, the log file named LOG.10/24/86 was opened on October 24, 1986.

You can have a maximum of one system event log file per day. For example, if you start your system (with event logging enabled) on Friday, October 24, 1986, the log file bears Monday's date (LOG.10/24/86). If you shut the system down and then restart it on Wednesday, 10/27/86, a new file is created with Wednesday's date as part of its filename (LOG.10/27/86). However, if you perform a second cold start on that Wednesday, then LOG.10/27/86 is reopened, and new entries are appended to it. Because old log files are not deleted by the event logger, it is up to you to delete them when necessary.

Access Rights to LOGREC*

You or the System Administrator must set an ACL on LOGREC* that gives User 1 ALL rights to the directory.

System Administrators and operators need at least DALURW rights to LOGREC* so that they can write to or purge the log files (with the PRINT_SYSLOG command) or delete them (with the DELETE command).

\$REST usually needs LUR rights. If you have a restricted system, you can assign NONE rights to \$REST, but SLAVE\$ must have at least LUR rights.

THE EVENT_LOG COMMAND

At Rev. 21.0, the EVENT_LOG command no longer activates the system event logging mechanism. For information on system and network logging on a Rev. 21.0 or later system, refer to the DSM User's Guide.

THE PRINT_SYSLOG COMMAND

Because the system event log files are in binary format, they cannot be read or edited with ED or EMACS, displayed with SLIST, or printed with SPOOL. You must use the PRINT_SYSLOG command to read or print the system event log files on pre-Rev. 21.0 systems. The following sections describe the PRINT_SYSLOG command.

PRINT_SYSLOG Format and Options

The format of the PRINT_SYSLOG command is as follows:

```
PRINT_SYSLOG [output-pathname] [options]
```

output-pathname specifies where the command's output is sent. The destination depends on what you specify on the command line:

- If you specify TTY for output-pathname, output is displayed at the user's terminal.
- If you specify a name other than TTY for output-pathname, the output is written to the file of that name.
- If you omit output-pathname, the output is written to the file LOGST in the current directory.

The default input file is the most recently created system event log file in LOGREC*. To specify an older log file, use the -INPUT option, which is described later in this chapter. If PRINT_SYSLOG cannot find a system event log file, it prompts for an input filename.

The following options are available to PRINT_SYSLOG:

<u>Option</u>	<u>Description</u>
<u>-CENSUS</u>	Totals the entries for each event in the input file and writes the totals to the output file or terminal. Only nonzero totals are displayed.
<u>-CONTINUE</u>	Continues after a bad entry is found. PRINT_SYSLOG normally halts if it encounters an invalid entry. If this option is specified, PRINT_SYSLOG continues processing in an attempt to find the next valid entry.
<u>-DEBUG</u>	Causes PRINT_SYSLOG to read entries from the terminal. Type each entry as a series of tokens (using rules for RDIK\$\$). Octal tokens are converted to binary; all others are taken as ASCII strings. PRINT_SYSLOG leaves this mode of operation whenever a Q, q, or null line is entered. (See the Subroutines Reference Guide, Volume III for information on RDIK\$\$.) Use this option for testing PRINT_SYSLOG's formatting for entry types.

<u>Option</u>	<u>Description</u>
<u>-DELETE</u>	Deletes the output file when processing of the log file is complete. Use only with the -SPOOL option.
<u>-DUMP</u>	Makes octal dumps of each entry processed, in addition to the normal formatting. Only those entries that have been selected for processing are dumped. -DUMP is an aid to users who define their own event types.
<u>-FROM</u> { <u>mmddyy</u> [<u>hhmm</u>] <u>TODAY</u> }	Processes only entries from the specified date to the latest entry. Specify TODAY to refer to today's date. <u>mmddyy</u> , if specified, must contain 6 digits (for example, use 020786 for February 7, 1986). If you specify <u>mmddyy</u> , you may give an optional time specification in the form <u>hhmm</u> (hours, minutes). <u>hhmm</u> may be a value ranging 0000 through 2359. If you do not specify <u>hhmm</u> , the default is 0000. PRINT_SYSLOG checks the date/time stamp of each entry to determine whether to format the entry. An entry that is out of sequence (for example, the wrong date entered by the operator) does not turn on entry formatting prematurely.
<u>-HELP</u>	Displays the PRINT_SYSLOG command format and a list of options.
<u>-INPUT</u> pathname	Specifies the pathname of the input log file to be processed. If this option is not specified, PRINT_SYSLOG uses the most recently created log file.
<u>-PURGE</u>	Empties (but does not delete) the input event log file when event log processing is complete. Write (W) access is required on the input file.
<u>-REMARK</u> text	Enters text directly into the input file. All text after the -REMARK option is taken as the text to be entered into the input file. Consequently, the -REMARK option must be the last option specified on the command line. text is an operator comment of type REMARK. text can contain a maximum of 80 characters and need not be surrounded by apostrophes.

OptionDescription

You can use this option, for example, to record an observation on some event that might affect the subsequent operation of the system. Write (W) access is required on the input file.

-SPOOL

Spools the output file when event log processing is complete. PRINT_SYSLOG displays the name of the output spool file. Do not use -SPOOL if you specify TTY for the output.

-TYPE t1 [t2 ...]

Processes entries only of the indicated types. (If the -TYPE option is not specified, all entries are processed.) The types can be one or more of the following:

<u>Type</u>	<u>System Event</u>
BADENT	Bad entry
CHECK	Machine check (including memory parity)
CHK300	P300 machine check
COLD	Cold start
DISKER	Disk error
DSKNAM	ADDDISK entry (local partitions only)
ECCULO	ECCU error, process logged out
MOD300	P300 missing memory module check
OVERFL	LOGBUF overflow entry
PACL	Priority ACL set
PAR300	P300 memory parity check
POWERF	Power fail check
QUIET	Machine check mode now quiet
REMARK	Operator remark
SHUTDN	Operator shutdown
SENSOR	Sensor check
SETIME	Operator issued a SETIME command
TIMDAT	Time/date entry
TYPE10	Entry for type 10
TYPE11	Entry for type 11
TYPE12	Entry for type 12
TYPE13	Entry for type 13
TYPE14	Entry for type 14
TYPE15	Entry for type 15
WARM	Warm start

Note

The time/date stamps associated with the selected entries are not processed unless you explicitly select TIMDAT (for example, -TYPE DISKER TIMDAT processes all disk errors and their associated time/date stamps). If you specify TIMDAT alone, all time/date stamps are processed. If you specify TIMDAT in conjunction with other types, only the time/dates of the selected types are processed.

READING SYSTEM EVENT LOG FILES

You can use three basic methods to read system event log files:

- Display the log file output on your terminal screen.
- Write the contents of the log file to an output file. You can then use a text editor (such as ED or EMACS) to read the file.
- Print the output file with the -SPOOL option.

Before reading a system event log file, decide which of the above methods and which PRINT_SYSLOG options to use. The following paragraphs describe how to specify these three methods and how to use some of the PRINT_SYSLOG options to control the format and contents of the output file.

Displaying the Latest Log File

To display at your terminal the contents of the most recent log file, use TTY as the output destination, as follows:

OK, PRINT_SYSLOG TTY

TTY tells PRINT_SYSLOG that you want to look at the log file on the screen (or, if you have a hard-copy terminal, on the terminal's paper printout). TTY is especially useful for systems that have hard-copy terminals as supervisor terminals.

The following example illustrates the output from the PRINT_SYSLOG command with TTY specified. The sample system event log file contains 12 system events that were entered from Saturday through Thursday. At the end of the output is a census list that gives the total number of each event type.

OK, PRINT_SYSLOG TTY

[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]

PRINT_SYSLOG EVENT LOG FOR INPUT FILE LOG.09/20/86

14:08:56 FRIDAY SEPTEMBER 26, 1986

04:32:00 SATURDAY SEPTEMBER 20, 1986

COLD START PRIMOS REV 20.2 CPU TYPE = P9955

MICROCODE REV = 66

PROCESSOR ID = 000000 000010 000005 000102 000000 000000 000000 000000
(OCT)

DISK MOUNT: SYSCMD ON 002460 (OCT)

DISK MOUNT: STAFF1 ON 051460 (OCT)

DISK MOUNT: STAFF2 ON 003062 (OCT)

DISK MOUNT: TYPING ON 061062 (OCT)

DISK MOUNT: ADMINS ON 100463 (OCT)

DISK MOUNT: MRKING ON 003260 (OCT)

DISK MOUNT: PUBREL ON 061260 (OCT)

02:24:40 THURSDAY SEPTEMBER 25, 1986

PRIORITY ACL set on disk SYSCMD by user 1 (user SYSTEM).

PRIORITY ACL set on disk STAFF1 by user 1 (user SYSTEM).

13:40:40 THURSDAY SEPTEMBER 25, 1986

DISK READ ERROR, DEVICE NUMBER = 003062 (OCT)(4004-SM CTRLR 1, UNIT 1)
CRA = 000000 046467 (OCT) CYLINDER = 183 HEAD = 0 RECORD = 3 (9 SECTORS
PER TRACK)

STATUS (ACCUM) = 100000 (OCT) STATUS (LAST) = 000002 (OCT) RETRIES = 2
(RECOVERED)

19:20:40 THURSDAY SEPTEMBER 25, 1986

DISK READ ERROR, DEVICE NUMBER = 003062 (OCT)(4004-SM CTRLR 1, UNIT 1)
CRA = 000000 021235 (OCT) CYLINDER = 82 HEAD = 0 RECORD = 5 (9 SECTORS
PER TRACK)

STATUS (ACCUM) = 110000 (OCT) STATUS (LAST) = 000012 (OCT) RETRIES = 10
WORD NUMBER = 001126 (OCT) CORRECTION = 000001 100000 (OCT) (CORRECTED)

TYPE	NUMBER
COLD	1
TIMDAT	4
DISKER	2
DSKNAM	7
PACL	2

END OF FILE 'LOG.09/20/86'. 12 ENTRIES, 12 PROCESSED
OK,

The example shows two PACL types, seven DSKNAM types, two DISKER types, four TIMDAT types, and one COLD type. (Notice that TIMDAT types are given in the census list, but are not included in the total entries because they are not counted as events.) For a summary of all the types, see the -TYPE option in the previous section, PRINT_SYSLOG Format and Options. For descriptions of the system event messages, see the following section, SYSTEM EVENT MESSAGES.

Writing the Latest Log File to an Output File

To write the contents of the system event log file to the default output file, use PRINT_SYSLOG without specifying TTY or a pathname. The output file, whose default name is LOGLST, is created in your current directory. You can then read LOGLST with ED or EMACS. You must have Add (A) rights to the directory in which the output file is to be stored. The following example shows the creation of the default output file:

```
OK, PRINT_SYSLOG
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
OUTPUT HAS BEEN PLACED IN FILE 'LOGLST'
OK,
```

The output from the system event log file is placed in the file LOGLST, which is stored in your current directory.

Specifying a Non-default Output File: To have PRINT_SYSLOG write the log file to an output file with a name and/or location other than the defaults, specify the name (other than TTY) of the output file. For example,

```
OK, PRINT_SYSLOG CALVIN>LOGLST.TEST
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
OUTPUT HAS BEEN PLACED IN FILE 'CALVIN>LOGLST.TEST'
OK,
```

In the previous example, the output is placed in the file LOGLIST.TEST, which is stored in the top-level directory named CALVIN.

Overwriting an Existing Output File: If the output file already exists before you issue the PRINT_SYSLOG command, you are asked whether you want to delete the existing output file. If you answer Y or YES (in either lower case or upper case), the old output file is overwritten by the new one. If you do not want to delete the existing output file, type N or NO. You are then prompted for the name of another output file, as in the following example:

```
OK, PRINT_SYSLOG
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
OK TO DELETE FILE LOGLIST? ANSWER: 'Y' OR 'N'! NO
NEW OUTPUT FILE NAME: LOGLIST2
OUTPUT HAS BEEN PLACED IN FILE 'LOGLIST2'
OK,
```

Printing the Latest Log File

To obtain a hard copy of the output file, use the -SPOOL option, as in the following example:

```
OK, PRINT_SYSLOG -SPOOL
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
OUTPUT HAS BEEN PLACED IN FILE 'LOGLIST'
YOUR SPOOL FILE IS 'PRT004'
OK,
```

In the example, the output from the system event log file is placed in the file LOGLIST, which in turn is spooled under the name PRT004.

Do not use the -SPOOL option if you specify TTY for the output. You can also use the SPOOL command to print any output file.

Reading Previous Log Files

Use the -INPUT option to read older log files. For example, to write an old log file (dated June 27, 1986) to the output file named LOGLIST.JUNE, enter the following command:

```
OK, PRINT_SYSLOG LOGLIST.JUNE -INPUT LOG.06/27/86
```

If you are not attached to LOGREC*, use LOGREC* as part of the pathname argument for the -INPUT option. The command line for the previous example is as follows:

```
OK, PRINT_SYSLOG LOGLST.JUNE -INPUT LOGREC*>LOG.06/27/86
```

In this example, LOGLST.JUNE is placed in your current directory.

Reading Parts of Log Files

Use the -FROM, -TYPE, and -CENSUS options to read a part of a log file. The -FROM and -TYPE options control which events are processed into the output file by PRINT_SYSLOG, and the -CENSUS option generates only a totaled list of event types.

Using the -FROM Option: To read only entries within a certain time period, use the -FROM option to specify a date and time. Only entries from the specified date and time to the latest entry are processed.

For instance, if the log file in the previous example spanned several days (from 06/27/86 to 07/04/86), you could use the -FROM option to read only the log entries from July 1 to the latest entry, as follows:

```
OK, PRINT_SYSLOG TTY -INPUT LOG.06/27/86 -FROM 070186
```

To read only the log events for the current day, use the TODAY argument with the -FROM option:

```
OK, PRINT_SYSLOG -FROM TODAY
```

Using the -TYPE Option: The -TYPE option tells PRINT_SYSLOG to process only entries of one or more specified types. The 25 types are listed under the description of -TYPE in the previous section, PRINT_SYSLOG Format and Options. If you are monitoring certain types of system events on your system, the -TYPE option makes the output more readable by limiting it to the types in which you are interested.

For instance, to read only the disk error and cold start event entries in a log file, use the -TYPE option with the DISKER and COLD arguments, as in the following example:

```
OK, PRINT_SYSLOG TTY -TYPE DISKER COLD
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
```

```
PRINT_SYSLOG EVENT LOG FOR INPUT FILE LOG.10/20/86
14:28:48 FRIDAY OCTOBER 24, 1986
```

```
COLD START PRIMOS REV 20.2 CPU TYPE = P9955
MICROCODE REV = 66
PROCESSOR ID = 000000 000010 000005 000102 000000 000000 000000 000000
(OCT)
```

```
DISK READ ERROR, DEVICE NUMBER = 003062 (OCT)(4004-SM CTRLR 1, UNIT 1)
CRA = 000000 046467 (OCT) CYLINDER = 183 HEAD = 0 RECORD = 3 (9 SECTORS
PER TRACK)
STATUS (ACCUM) = 100000 (OCT) STATUS (LAST) = 000004 (OCT) RETRIES = 4
(RECOVERED)
```

```
DISK READ ERROR, DEVICE NUMBER = 003062 (OCT)(4004-SM CTRLR 1, UNIT 1)
CRA = 000000 046467 (OCT) CYLINDER = 183 HEAD = 0 RECORD = 3 (9 SECTORS
PER TRACK)
STATUS (ACCUM) = 100000 (OCT) STATUS (LAST) = 000002 (OCT) RETRIES = 2
(RECOVERED)
```

```
DISK READ ERROR, DEVICE NUMBER = 003062 (OCT)(4004-SM CTRLR 1, UNIT 1)
CRA = 000000 021235 (OCT) CYLINDER = 82 HEAD = 0 RECORD = 5 (9 SECTORS
PER TRACK)
STATUS (ACCUM) = 110000 (OCT) STATUS (LAST) = 000012 (OCT) RETRIES = 10
WORD NUMBER = 001126 (OCT) CORRECTION = 000001 100000 (OCT) (CORRECTED)
```

TYPE	NUMBER
COLD	1
DISKER	3

```
END OF FILE 'LOG.09/20/86'. 18 ENTRIES, 4 PROCESSED
OK,
```

Using the -CENSUS Option: The -CENSUS option totals each type of event entry in the log file and lists the totals. For example, use the -CENSUS option as follows to display the census list for the log file named LOG.04/26/86:

```
OK, PRINT_SYSLOG TTY -INPUT LOG.04/26/86 -CENSUS
[PRINT_SYSLOG Rev. 20.2 Copyright (c) Prime Computer, Inc. 1985]
```

```
PRINT_SYSLOG EVENT LOG FOR INPUT FILE LOG.04/26/86
09:22:20 MONDAY AUGUST 25, 1986
```

TYPE	NUMBER
COLD	1
TIMDAT	4
DISKER	1
SHUTDN	1
DSKNAM	7
PACL	7

```
END OF FILE 'LOG.04/26/86'. 17 ENTRIES, 17 PROCESSED
OK,
```

Entering Remarks Into Log Files

Use the -REMARK option to record in the log file an observation of some event that may affect the subsequent operation of the system. To use the -REMARK option, you must have write (W) access to the system event log file.

Because all text after the -REMARK option is entered into the log file, the -REMARK option must be the last option specified on the command line. In addition to the message, the date and time of the entry is also entered in the latest log file.

In the following example, the operator enters a comment about the cause of a system shutdown:

```
OK, PRINT_SYSLOG -REMARK System shutdown due to lightning storm.
```

The message, together with the date and time the PRINT_SYSLOG command was given, is recorded in the latest log file. An outbreak of disk errors later, for example, may be traced back to the effects of the lightning storm.

Spooling and Deleting Log Files

The -SPOOL option of the PRINT_SYSLOG command spools the output file and the -DELETE option deletes it. Use the -DELETE option only with the -SPOOL option.

The following example spools and then deletes the LOGLIST file for an event log file called LOG.07/08/86:

```
OK, PRINT_SYSLOG -INPUT LOG.07/08/86 -SPOOL -DELETE
```

The -DELETE option deletes only the output file. Therefore, if you use this option to make room in your directory, remember to delete the log file (with the DELETE command) as well.

The following example spools out and then deletes the output files for all log files dated before June 25, 1986, using the wildcard name LOG.@@ and the command processor wildcard option -BEFORE:

```
OK, PRINT_SYSLOG -INPUT LOG.@@ -BEFORE 6/25/86 -SPOOL -DELETE
```

Then, to delete all of the log files before June 25, 1986, use the DELETE command with the same wildcard name and options:

```
OK, DELETE LOG.@@ -BEFORE 6/25/86 -NO_VERIFY -REPORT
```

See the PRIMOS Commands Reference Guide for information on the DELETE command and on wildcards, including the -BEFORE and -NO_VERIFY wildcard options.

PRINT_SYSLOG MESSAGES

These messages may be displayed when you invoke the PRINT_SYSLOG command to read an event log file. They may indicate a problem using the command.

- BAD ENTRY ENCOUNTERED IN FILE <logfile>.

The system event log file named logfile contains an entry that is not defined by PRINT_SYSLOG. You may have a version of PRINT_SYSLOG older than your version of PRIMOS (in which case you have outdated event types) or, you may have incorrectly defined your own event type.

- CANNOT OPEN OUTPUT FILE <logfile>

The output file named logfile cannot be opened because you do not have the proper access rights in the file's directory. You must have Add (A) rights to the directory.

- CANNOT PURGE FILE '<O>LOGREC*>LOG.mm/dd/yy'

You specified the -PURGE option, but you do not have Write (W) access to the input log file.

- COMMAND OPTION NOT RECOGNIZED.

You specified an invalid option to PRINT_SYSLOG.

- Default input filename not constructed.

A file of the type LOG.mm/dd/yy cannot be found in LOGREC*; or, the top-level directory LOGREC* does not exist on logical device 0; or, you have insufficient access rights.

- INPUT LOGGING FILE <filename> NOT FOUND.
UFD <O>LOGREC* CONTAINS LOGGING FILE FOR THE LATEST COLD START.
ENTER INPUT FILE NAME (ENTER CR TO QUIT):

You did not specify a valid input event file. List the contents of LOGREC* for the names of valid input event files. PRINT_SYSLOG prompts you for the input filename.

- Insufficient access rights.

You do not have the proper access rights to the directory. You need ALURW (Add, List, Use, Read, Write) to read and write in the directory. You also need D (Delete) rights to delete files.

- <bad-type> IS NOT A SYSTEM TYPE.

You specified an invalid type, bad-type, with the -TYPE option.

- OK TO DELETE FILE <filename>? ANSWER: 'Y' OR 'N'!

An output file named filename already exists. You are being asked whether filename should be deleted and replaced by the new output file. Enter YES to delete the file, or NO to enter a new filename. If you enter NO, you receive the following prompt.

NEW OUTPUT FILE NAME:

Enter the name (other than filename) of the output file. Entering TTY sends output to the terminal. If you enter a null line, you are prompted with the preceding message sequence, until you enter a new filename.

- OUTPUT HAS BEEN PLACED IN FILE <filename>

PRINT_SYSLOG has completed the processing of the event entries and all other file manipulation requested by the user. This message is generated if output was directed to a file.

- '-SPOOL' OPTION MAY NOT BE USED WITHOUT AN OUTPUT FILE.

You incorrectly specified the -SPOOL option with TTY as the command's output destination.

- UNKNOWN CPU MODEL <xx>.

PRINT_SYSLOG found an invalid CPU model number. PRINT_SYSLOG generates this warning message and continues processing, treating the CPU model number as 0. This message is informational only. Most likely, you have a version of PRINT_SYSLOG older than your version of PRIMOS.

SYSTEM EVENT MESSAGES

The following messages may appear in the event log output file. These system event messages inform you about the status of the system.

- BAD ENTRY: <xxxxxxx> ... (OCT).

An entry of unrecognized type or of a length longer than 81 halfwords was encountered. An octal dump of the entry is provided for the number of words contained in the length field.

OPERATOR'S GUIDE TO SYSTEM MONITORING

- COLD START PRIMOS REV <rr> CPU TYPE = <cpu>
MICROCODE REV = <mm>
PROCESSOR ID = <iiiiii>...
(OCT)

A cold start of PRIMOS was performed. rr is the PRIMOS rev number. cpu is the type of CPU. mm is the revision of the microcode running. The cold start entry contains eight halfwords of information (iiiiii) obtained from the STPM (Store Processor Model number) instruction.

- DISK <jj> ERROR, DEVICE NUMBER = <pdev> (OCT) (typecode).
CRA = <aaaaaa aaaaaa> (OCT), CYLINDER = <xxx> HEAD = <xx>
RECORD= <xx> RCRA= <xxxxxx xxxxxx> (OCT).
STATUS (ACCUM) = <ssssss> (OCT) STATUS (LAST) = <llllll> (OCT)
RETRIES = <nn yy>

A disk read-error or write-error occurred during the indicated operation. jj indicates READ or WRITE. pdev indicates the physical device number. typecode indicates controller number and device type (SM = Storage Module, Disk Cartridge Module, Device, or Fixed-Media Disk). aaaaaa aaaaaa shows the error's record address. The cylinder, head, and record addresses are given in decimal. xxxxxx xxxxxx is the current record address read on a CRA error and is given for read operations only.

ssssss is the Boolean OR of all status bits obtained during retries. llllll is the status of the last operation. nn is the number of retries attempted.

yy is RECOVERED if the operation was completed successfully. yy is UNCORRECTABLE if the error could not be corrected. If the error has been successfully corrected by the software, yy is "WORD NUMBER = wwwww (OCT), CORRECTION = cccccc (OCT)". wwwww indicates the record's corrected halfword number. cccccc indicates the 32-bit correction pattern.

- DISK MOUNT: <partition-name> ON <pdev> (OCT)

An ADDISK or STARTUP command was issued. partition-name was mounted on the disk identified as pdev.

- LOGBUF OVERFLOW -- <xxxxxx> ENTRIES LOST

xxxxxx (decimal) event entries were lost because of overflow of the event log buffer (LOGBUF). Most likely, the same error has caused so many other errors that the event log buffer overflowed. The entries lost are probably only repeated entries of those already listed.

- MACHINE CHECK MODE NOW QUIET

PRIMOS entered quiet machine check mode. This action occurs after 1024 ECCC (correctable memory errors) and causes subsequent ECCC errors to go unreported in order to prevent filling up the system event log file.

- MACHINE CHECK <ccc>... DSWSTAT= <ssssss ssssss> DSWRMA= <yyyyy rrrrrr> <rrrrrr> (OCT). DSWPB= <pppppp pppppp> (OCT). [DSWPARITY <xxxxxx xxxxxx> (OCT)]

A machine check occurred. DSWSTAT, DSWRMA, DSWPB, and DSWPARITY give information regarding the Diagnostic Status Word (DSW) at the time of the check. DSWPARITY is not displayed for all Prime systems. DSWPARITY identifies the reporting board and signal name.

If DSWPARITY is not present, ccc is an encoding of the machine check code. If the RMA INVALID bit is set (bit 9 of DSWSTATL), yyyyy is (INV). Otherwise, yyyyy is absent.

- MISSING MEMORY. DSWSTAT = <ssssss ssssss> (OCT). DSWRMA = <yyyyy rrrrrr rrrrrr> (OCT). DSWPB = <pppppp pppppp> (OCT). [DSWPARITY = <xxxxxx xxxxxx> (OCT)]

A missing-memory check occurred. DSWSTAT, DSWRMA, DSWPB, and DSWPARITY give information regarding the Diagnostic Status Word (DSW) at the time of the check. DSWPARITY is not displayed for all Prime systems.

If the RMA INVALID bit is set (bit 9 of DSWSTATL), yyyyy is (INV). Otherwise, yyyyy is absent.

- MEMORY PARITY (www) DSWSTAT= <ssssss ssssss> (OCT). DSWRMA= <yyyyy rrrrrr rrrrrr> (OCT). DSWPB= <pppppp pppppp> (OCT). [DSWPARITY= <xxxxxx xxxxxx> (OCT)]
PHYSICAL PAGE NUMBER = <nnnnnn> (OCT), WORD NUMBER = offset (OCT).
REAL ADDRESS = <aaaaaaaa> (OCT). [CACHE ADDRESS = <cccccc> (OCT)]

A memory parity error occurred. www is either EOC CORRECTED or EOC UNCORRECTED. DSWPARITY is displayed but not decoded. For a corrected error, nnnnnn is followed by "Bit = y," where y indicates the bit in error (1-16 = bits 1-16; LP = left parity; RP = right parity; C2, C4, C5 = other check bits; MB = multibit; NE = no error). This is followed by OVERALL PARITY = x, where x is 0 or 1, and reflects the setting of DSWSTATL bit 6.

- POWER FAIL CHECK

A power fail check occurred.

OPERATOR'S GUIDE TO SYSTEM MONITORING

- PRIORITY ACL set on disk <diskname> by user <nn> (user <username>)

A priority ACL was set on partition diskname. nn is the decimal number of the user who set the ACL and username is the name of that user.

- <Text of operator remark>

The text is the contents of the REMARK event, generated by use of the -REMARK option to PRINT_SYSLOG.

- SHUTDOWN BY OPERATOR

The operator issued a SHUTDN ALL command. (This event causes the event log buffer to be automatically dumped.)

- SHUTDOWN DUE TO CHECK FROM SENSORS. REGISTER 26: <stat1 stat2>(OCT)

A sensor check occurred and caused the loading of register 26 with the sensor status data (stat1 stat2) and the shutting down of the system. Possible causes for this are

Board temperature too high.
Cabinet temperature too high.
Low air flow.
UPS battery low.

- TYPE = <tt>. DATA= <dddddd> ... (OCT).

An input file entry of types 10 through 15 was encountered. tt is the type of entry. dddddd is a display that can contain a maximum of nine halfwords of information from the entry.

- WARM START

A warm start of PRIMOS was performed.



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